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Michael Anschuetz photos



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### 3RD WEEK OF JANUARY

From modern day firearms to historically significant models, we kick off this week's show with SIG's cutting edge Model 320 Conversion kit. It is an extra special package in terms of a striker-fired modular pistol platform, and we give it a run thru at the range. A recognized name from the past—from the World War II era—is back with a gun from the past as Inland Manufacturing reintroduces the M1 carbine it produced in the 1940s. It's almost an exact reproduction of the original, and better yet, they've found a way to improve the accuracy of the little carbine, which is also available with a folding stock.

Finally, we close out the show by accessing a sound meter to measure noise in this suppressed/unsuppressed segment. Your eyes (and ears) may be surprised by the results we uncover.

And Craig Boddington and Kyle Lamb talks about transitioning from the Model 1911 to the M9 in our Banking On Beretta segment.

### 4RD WEEK OF JANUARY

Ruger's ever-popular GunSite/Scout rifle is chambered in a new caliber—.223—and even better news is that it is being offered with a threaded barrel so you can screw on a suppressor of your choice and fire away with considerably less report. Significant advancements in optics is Leupold's long-standing reputation, and 2015 will be no different as it introduces its LCO. Curious what this optic has to offer? Tune in for this exclusive report.

"Option overload" may be a term you've come to use when trying to decide which suppressor is best for you and a specific firearm. We jump right into the mix and sort out some of what's available and potentially what some of the best options are for you, whether target shooting or hunting. You won't want to miss this report.

### 1ST WEEK OF FEBRUARY

"Subsonic" is often one of the more misunderstood terms in the shooting lexicon, so we offer a basic explanation of standard versus subsonic loads by highlighting two of Black Hills' 9mm factory loads. We address the often-overlooked—but extremely important—topic of magazines and improvements made. We also offer reviews on a couple more products, highlighting a suppressed .22 semiauto rifle with carbon-fiber barrel and some new gear from Blackhawk that goes under the banner of "Under The Radar." In today's world, you will find these items will come in handy and prevent loss of personal information.

### 2ND WEEK OF FEBRUARY

Ever seen a flame "lick" the end of a suppressor due to high-volume shooting? Few have, but we have it captured in high definition as Patrick Sweeney runs an AR til it glows, steams, and smokes....basically, until it gets "as hot as fire..." (more)

What happens to gun and suppressor? Tune in....you'll be surprised as .223 mags fly and hundreds of rounds go downrange in a matter of seconds.

That's just the start of a great show....we highlight two new guns to the market—S&W's new compact M&P .22 pistol and SIG's 556 in 7.62x39, a cartridge that is gaining considerable momentum.

We finish up this week's show with a couple of compact personal defense guns and the best way to carry and draw when you've got to protect yourself or family. Find out about this pair of reliable pistols and gain some excellent advice on how to carry and draw in pressure situations.

### 3RD WEEK OF FEBRUARY

Suppressors are the current rage in the shooting sports, with at least 40 states allowing ownership, and manufacturers are responding with multiple product options for rifles, pistols—and even shotguns! Learn everything you need to know about suppressors by watching this new segment, "Suppressors: Silence Is Golden."

Craig Boddington and Kyle Lamb team up to pass along their firearms knowledge—based on decades of experience in the field and at the range—in "Rifle Revolution." Craig handles the bolt-action rifle category while Kyle addresses features on his favorite platform—the AR.

2015 marks the 30th anniversary of Beretta winning the M9 contract (and 100th anniversary of building semiauto pistols), and in this new segment ("Banking On Beretta's M9/M92"), we call on a number of our and Beretta's resident experts—ranging from military veterans to law enforcement to people involved in the rigorous testing of the M9—to file these special reports.

### 4TH WEEK OF FEBRUARY

The biggest and brawniest semiauto pistol made highlights this week's show, with Magnum Research's .50 AE Desert Eagle in the spotlight. Handgun Editor Patrick Sweeney offers his views on this behemoth, and while it doesn't necessarily shake the ground you're standing on when you pull the trigger, it lets you know you have a handful of pistol in your hands. Former special ops Tom Beckstrand offers personal perspective and interesting insight into an incredibly accurate load—Black Hills .308 Match-- and then we turn our attention on how to handle all the paperwork involved in purchasing/owning a suppressor.

### 1ST WEEK OF MARCH

Amazingly (by today's standards), when first introduced, suppressors were considered "mainstream" and could be shipped in the mail...and there's a lot more interesting history to suppressors as we show an old Colt Woodsman .22 with original suppressor. Amazing and intriguing to say the least...

We check out Stag Arms' new 9mm carbine in our At The Range segment, along with S&W's new M&P 9mm pistol and M&P-15 .223—with threaded barrels and suppressors. You'll be amazed at the difference a suppressor makes.

Finally, Boddington and Lamb talked about "enhanced triggers" in both AR firearms and Beretta offers a behind-the-scenes report into the actual "torture" testing of the M9 leading up to Beretta winning the contract 30 years ago.

(more)

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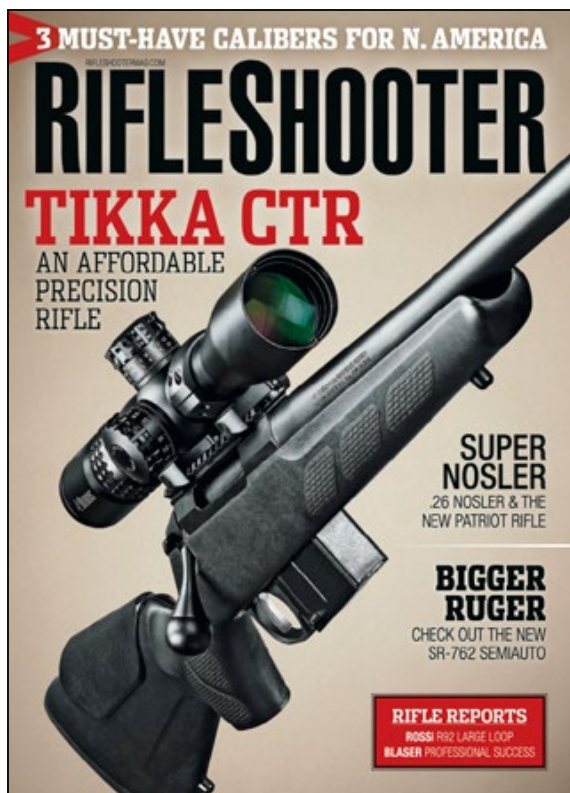
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## Chamber Check

The November/December 2014 edition of *RifleShooter* was really loaded with good articles. Regarding Boddington's article on the three North American cartridges, his thoughts on selecting the three rifle chamberings were interesting—although I rarely use my .17 Hornet or .223 Rem. Selection of the .270 Win. and the .338 Win. Mag. was dead on. They're my favorites for the same reasons. I have owned and used rifles from the .17 Hornet to .458 Win. Mag., and it has been interesting to see my preference shift downward in chamberings as I grow older.

J.P. Tyson  
Denison, TX

For years I've read Craig Boddington's articles and books on guns and cartridges for game all over the world. He's a no-BS gun writer with a lot of practical insights—awful hard not to like and respect him. His conclusions for the .204 Ruger, .270 Win. and .338 Win. Mag. as the do-it-all cartridges for North American game took some real guts to write. By his own admission he came full circle on the .270 over a .30 caliber but adopted the relatively new

.204. In an era of terrific bullet options, it was refreshing that Craig stayed away from the "buzz and sizzle" cartridges other writers embrace in favor of the practical and widely available.

Bill Little  
Fayetteville, NY

## Suppressor Options

In the September/October article on suppressors, you neglected to mention that chief law enforcement signature is not required on ATF applications for suppressors through a trust. The suppressor is registered to the trust and not the individual. This is a common method of obtaining a suppressor in locations where the law enforcement officer will not sign an application. Earlier this year there was a proposal to change legislation that would require that applications through trusts and corporations have that signature, which would prevent law abiding citizens from obtaining a suppressor. Fortunately, the comment period was extended to 2015, delaying potentially negative new requirements.

Hiram Patterson  
Dallas, TX

## Photo Error

Was looking at my November/December 2014 issue of *RifleShooter*. Noticed something off in the Tikka T3 CTR photo. It shows .300 Win. Mag. rounds, but the article states it is only available in .308 Win. and .260 Rem. Looks like somebody in the studio goofed. Overall, I like the job you do.

Roger Buettner  
Appleton, WI

*Mr. Buettner: A few readers commented on this, and I'll own the error. The art and photography staffers aren't responsible for knowing what guns are chambered to, and since we don't work in the same office, I'm not available to look at the setups beforehand. And I simply failed to notice which cartridges were used in the photograph.—JSR*

**WE'D LIKE TO HEAR FROM YOU.** E-mail your comments, criticisms or suggestions to [rifles@imoutdoors.com](mailto:rifles@imoutdoors.com). Or you can drop us a line at Mailroom, RifleShooter, P.O. Box 13786, Torrance, CA 90503. Please include your name and your city and state of residence with your correspondence. Letters may be edited for brevity and clarity.



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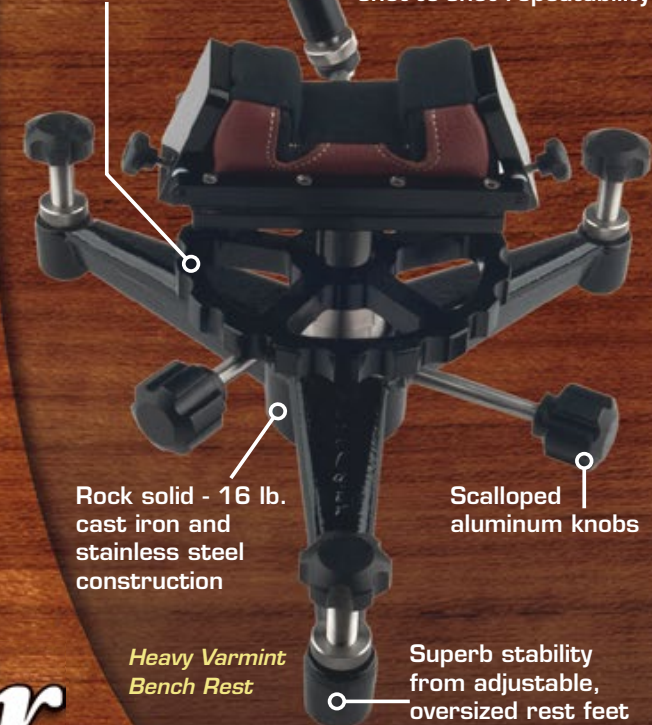
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# Speed Solutions



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*By J. Scott Rupp*

**M**y favorite guitarist, the late Jerry Garcia, once said, "On this planet, louder is better." And so it is with hunting cartridges in America: Most hunters believe faster is better.

All things being equal bullet-wise, a faster projectile shoots flatter and is less affected by wind. That in turn makes it less likely errors in range or angle estimation or wind reading will result in a miss or wounding hit. And the bullet will have more muscle behind it when it arrives on target.

There are two ways to get down-range speed: Push the bullet faster at the start—the magnum route—or use a bullet with a high ballistic coefficient in order to retain speed better.

For those who aren't familiar with BC, it's a way to measure how well a bullet handles air resistance. A sleek, boattailed, sharply pointed bullet has a higher BC than, for example, a lead-tipped roundnose and won't slow as quickly as it travels downrange.

Last year my wife and I traveled to Kazakhstan to hunt Mid-Asian ibex. I decided to take the .280 Rem. I've owned for decades and have recently been upgrading. Now, the .280 is no speed demon, and I knew from editing Craig Boddington's work over the years that Asian mountain hunting can bring shots on the long side—like 400 yards and even farther. While I hoped to avoid shooting such distances, I did want to reduce wind drift and also maximize on-target energy because, as Craig reminded me when we discussed

the trip, ibex are tough critters.

If you're a .280 Rem. shooter you know there's not exactly a ton of choices in factory ammo, so most of us reload it. And that was a good thing in this case because it allowed me to try two relatively new bullets designed specifically with ballistic coefficient in mind: the Nosler 150-grain AccuBond Long Range (ABLR) and the Barnes 145-grain LRX.

The Nosler's BC is a whopping .611 (G1 model). Nosler also gives the G7 model figure—which some long-range shooters feel is a better representation of BC at distance—as .309. The LRX has a G1 BC of .486, and it's worth noting Barnes derives its BC figures at 300 yards. (Bullet BCs change as the bullet slows, which is why companies such as Sierra list different BCs for different velocities for the same bullet.)

The solid copper LRX was introduced in 2011, and it's a version of the Tipped Triple Shock (TTSX). But it's not just a longer, heavier TTSX. As Barnes's



Brett Throckmorton explains it, to optimize the bullet for long range, designers adjusted the ogives to be more secant (you can look that up), the boattails were made longer and the bullet shank cannelures were adjusted to boost BC. Internally, the LRX's cavity was modified so it would open properly at slower speeds; even with a high BC the bullet will be moving relatively slowly at really long range.

One of the great characteristics of the Barnes X bullet and its successors has always been high weight retention, and with the LRX that doesn't change.

"Negating the tip, shooters can expect to see nearly 100 percent weight retention with the LRX," Throckmorton says. "However, if you find yourself in a situation where you are shooting an animal at 40 yards with a .30-378 Wby. and the 175-grain LRX, that bullet will most likely shed a petal or two, but not before fully expanding. So it will still do its job and still retain around 80 percent of its original weight."

The knock against the original X was that some rifles didn't shoot it well, but changes in design that debuted with the Triple Shock and TTSX—most notably the shank cannelures that reduce bearing surface, a change carried on in the LRX—have made finicky accuracy less of a problem.

I got excellent 100-yard three-shot groups with the 145-grain LRX with both Reloder 19 and Reloder 22, but at 200 yards the Nosler ABLR proved to be more accurate in my rifle. I do plan on working more with the LRX, trying more powders and experimenting with seating depths (the company advises starting with 0.050 inch of bullet jump).

The ABLR bullet, introduced in 2013, is based on the company's AccuBond, and like the LRX, it isn't just a heavier and longer version but one redesigned for high BC. Nosler's Zach



Bullet engineers tweak both the external and internal design aspects of bullets such as the Nosler ABLR and Barnes LRX to increase ballistic coefficient and also ensure the bullet will perform as it's supposed to once it reaches its target.

Waterman says the ABLR has a longer boattail and a slowly tapered, tangent ogive (again, look it up; the concept of tangent is too much for a non-math person like me to explain in a short article) for each caliber and weight.

Since the ABLR design features a copper jacket bonded to a lead core, unlike the monolithic LRX, two other design aspects had to be changed.

"The AccuBond has a thicker jacket at the nose, which gives it a minimum impact velocity of 1,800 fps," Waterman explains. "Since the ABLR was designed for shooting at longer ranges, it has a thinner jacket at the nose and a large hollow cavity behind the polymer tip, which allows the ABLR to have a minimum impact velocity of 1,300 fps for effective terminal performance at long distances. The ABLR has a maximum impact velocity of 3,400 fps.

"The ABLR is designed to have 50 to 70 percent weight retention, depending on impact velocity," he says. "Since the ABLR has a much softer nose and larger nose cavity than the AccuBond, weight retention tends to be 50 percent at maximum impact velocities of 3,400 fps and 70 percent or more at 2,500 or slower."

I killed my ibex at a reasonable 250 yards, at which point my bullet would've been traveling a touch faster than 2,600 fps. We found the bullet on the far shoulder, just under the hide, and it weighed 100.7 grains. That's

## Tale of the Tape

Caliber	Bullet Weight (gr.)	G1 Ballistic Coefficient*
<b>Nosler AccuBond Long Range</b>		
6.5mm	129	.561
.270	150	.625
7mm	150	.611
7mm	168	.652
7mm	175	.672
.30	190	.640
.30	210	.730
<b>Barnes LRX</b>		
6.5mm	127	.468
.270	129	.463
7mm	145	.486
7mm	168	.550
.30	175	.508
.30	200	.546
.338**	265	.575
.338**	280	.667

\*300 yd. figures for LRX \*\*Designed for .338 Lapua

about 67 percent weight retention—in line with what the bullet should do—and you can see from the accompanying photo it produced a good mushroom and frontal area.

I recently read an article that basically said these super-high BC bullets aren't gaining you anything. I disagree. Certainly they won't take a pedestrian cartridge and turn it into a death ray. My ibex ABLR load—a max charge of Reloder 22, Nosler case, Federal 210 primer—leaves the muzzle at 2,936 fps on average. It drops only 6.2 inches at 300 yards and just 17.8 inches at 400 yards; drifts 3.8 inches at 300 and 6.8 at 400; and generates respective energies of 2,199 and 2,006 ft.-lbs. at those distances (based on 200-yard zero, 5,000 feet elevation, 50 degrees, 10 mph wind, 78 percent humidity).

By my calculations, I get about a seven percent increase in velocity and energy at 300 yards over what I would've had with a standard BC bullet of the same weight. And I get it without incurring extra recoil and muzzle blast, which I count as a win. The increase also gave me added confidence that a cartridge most people wouldn't choose for such a hunt would work just fine if I did my part. ■



1



2



# The Ham-Handed Gunsmith

## REPLACING A RECOIL PAD

By J. Scott Rupp

**R**emember when Remington brought out its first soft, squishy recoil pad, the one that made its debut on the 700 CDL back around 2004? It was great at soaking up recoil, but over time the compound the company used broke down—becoming tacky, sticking to carpets and gun-safe liners and generally creating a mess. At least mine did, and I had to replace it. I bought a Limbsaver and thought that this would be a project so simple even I could handle it.

Not quite. When I unscrewed the old pad and tried to install the new one, I found the holes in the stock were now too large and the screws wouldn't hold. At first I thought I could simply find bigger screws. No. Then I thought I could fill the holes with wood putty or glue, but in researching it that didn't seem wise. So I did what I always do when I'm faced with any gunsmithing project that's out of my league (as in, all of them): Get hold of Reid Coffield, who writes gunsmithing articles for our sister publications *Shooting Times* and *Shotgun News*. He set me straight. Here's how to do it successfully—even if you're ham-handed like me and have only basic tools.

**1** Use dowels to fill the holes, matching dowel size to drill bit size. I used 1/4 inch.

**2** Drill out the old holes.

**3** Fill the holes with glue (which I kinda overdid). Reid stressed the importance of cutting slots in the dowels to allow the glue to flow out. I used a Dremel tool with a cutting wheel to accomplish this. Not pretty, but it worked.

**4** Tap in the dowels. Let it dry. I allowed it to sit for a full day.

**5** Cut off the dowels. I used a hacksaw. That got them pretty close to flush but not quite, so I finished them off with a file.

**6** Drill into the dowels to accommodate the screws. Unsure what size bit? I measured the screw shank with my reloading caliper and then referred to [ENGINEERSHANDBOOK.COM/TABLES/WOODSCREWPILOTHOLES.HTM](http://ENGINEERSHANDBOOK.COM/TABLES/WOODSCREWPILOTHOLES.HTM) to determine the proper size drill bit for the pilot holes.

**7** Screw in the new pad. I applied a bit of grease to the driver shaft to make it easier. Hold the pad in place as you tighten the last little bit so the pad fits flush. Voilà!

3



4



5



6



7







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# .220 Swift vs .22-250 Rem.

**J**ust two decades after the .250 Savage made history by breaking the 3,000 fps barrier, the .220 Swift cartridge managed to top 4,000 fps.

Introduced in 1935 for use in the Winchester Model 54 bolt action, the .220 Swift was indeed an impressive cartridge, and until the release of the .223 WSSM in 2003, it remained the fastest commercial round in existence.

Based on the 6mm Lee Navy, the .220 Swift set a new standard for ultra-fast varmint rounds, and it quickly gained favor among varmint hunters who appreciated the Swift's extremely flat trajectory.

In 1964 Winchester dropped the .220 Swift in favor of the .225 Win., which was based on the .219 Zipper. That turned out to be a bad move because, just a year later, Remington standardized a popular wildcat developed by Grosvenor Wotkyns called the .22 Varminter, which was based on the .250 Savage.

When Remington standardized the cartridge in 1965, it christened it the .22-250 Rem. The new round immediately usurped the .225 Win. as the most popular hot .22. (Ironically, Winchester had apparently passed on Wotkyn's .250 Savage-based design for the Swift in favor of the Lee Navy design.)

Ballistically, the .220 Swift has a greater case capacity than the .22-250 Rem. (47 grains of water for the Swift, 43.5 for the .22-250). That's an almost 10 percent boost in powder capacity, but increased capacity doesn't always relate directly to superior performance.

Phil Sharpe, who was closely involved with the development and rollout of both cartridges, believed the Swift performed best when loaded to near full capacity but the .22 Varminter (later the .22-250 Rem.) was more versatile. He gave credit to the .22-250's

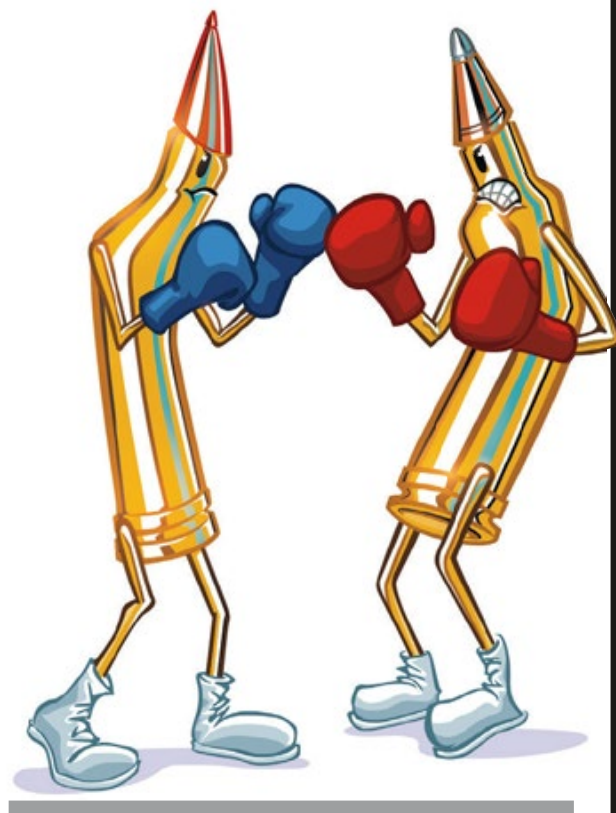
steep shoulder and less powder being burned in the rifle's throat.

The .220 Swift earned a reputation as a barrel-burner, but the advent of modern powders, better bullets and improved barrels has helped the .220 Swift reach full potential without ruining barrels as quickly as it once did.

Factory loads for the .220 Swift aren't as readily available as loads for the .22-250. Hornady offers loads for both cartridges, six for the .22-250 (though one, the 60-grain softpoint, is currently listed as suspended on Hornady's site) and two for the .220 Swift. Bullet weights range from 35 to 60 grains for the .22-250, but only 55- and 60-grain offerings are available for the .220 Swift.

Handloaders can make the most of the .220 Swift's larger case capacity, though. According to Nosler's reloading data, the .22-250 loaded with 42.5 grains of Hodgdon CFE 223 can achieve a maximum velocity of 4,325 fps. The fastest Swift load listed is 4,203 fps with 39 grains of Hodgdon 4895. The velocity race gets closer with 55-grain bullets, and with 60-grain projectiles and above, the .220 Swift is capable of beating the .22-250 by 100 fps or more.

The .220 Swift's design makes better use of heavier projectiles provided that the rate twist is correct. Many early rifles had a 1:14 twist for stabilizing lighter projectiles.



In terms of availability, the .22-250 is a clear winner. Most varmint rifles are available in .22-250, but there are far fewer chambered for the Swift. If you buy factory ammo, the .22-250 is also the champion with tons of choices; pretty much everybody loads it.

While the Swift is less popular, there are still plenty of used rifles around. And Ruger chose to chamber 2014's No. 1 Varminter for the .220 Swift, so there is certainly still interest in the cartridge. Some shooters may think the .22-250 is too vanilla. In that case, the .220 Swift has an exclusivity and panache that the .22-250 simply doesn't have.

## .220 SWIFT

### HITS

- Superior performance with heavy bullets
- New powders, bullets increase its utility
- Bigger cool factor

### MISSSES

- No major advantage over the .22-250
- Limited factory ammo offerings
- Rifles can be hard to come by

## .22-250 REM.

### HITS

- Big selection of rifles, ammo
- Performs well with wide variety of loads
- Great ballistics for such a small case

### MISSSES

- Not as capable with heavy bullets
- Can't match Swift's case capacity
- Tons of varminters shoot it so not as cool



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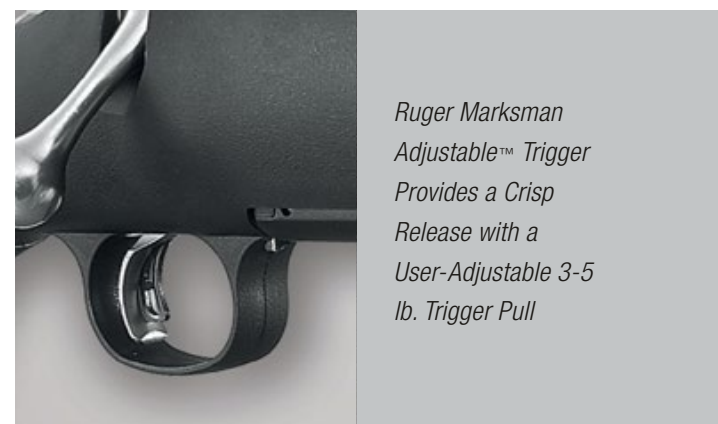


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## NEW GEAR » J. Scott Rupp



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### Leupold Mark 6 Throw Lever

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# The Neck Question

**HORNADY'S NEW MATCH GRADE BUSHING DIES HELP ADDRESS AN ISSUE THAT VEXES SERIOUS ACCURACY BUFFS.**



Hornady's Match Grade bushing sizing die allows handloaders to compress the neck of a case by only the amount necessary to securely grip a bullet—making for longer case life, less case stretch and better accuracy.

**W**hen resizing a fired rifle case, the full-length sizing die most commonly used compresses the malleable brass back down to minimum dimensions. For hunting purposes, this is as it should be; minimum dimension cartridges flow in and out of rifle chambers easily. However, cartridges built on fully resized cases fit somewhat loosely in the chamber, and when gravity pulls them to the lower part of the chamber, the projectile is not centered in the bore.

In pursuit of ultimate accuracy, precision handloaders are often able to gain consistency by neck sizing only. A dedicated neck-size die compresses only the expanded neck down to original spec. Thus sized, the uncompressed body of the case fills the rifle's chamber more fully, centering the bullet better and presenting it more squarely into the rifling leade when fired.

Many shooters—myself included—often use a hybrid method of neck sizing on cases with longish necks, such as the .30-06 and .300 H&H Mag. By leaving a full-length sizing die shy of contacting the shell holder by 0.05

inch to 0.10 inch or so, you can size the forward portion of your case necks without affecting the case walls very much. The method works acceptably on cases with a lot of body taper, such as the aforementioned .300 H&H or the 7x57 Mauser, but in most cases you're far better off with a proper neck size die.

Why is all this important? For one thing, whether you neck size or full-length size your cases, case necks are compressed down far beyond what is necessary, then expanded back up to whatever spec is common for the particular cartridge you are loading. This overworks brass and shortens its usable life. Additionally, dragging a much-reduced brass case neck over an expander ball lengthens the case—often to the tune of 0.003 inch or more—which contributes to shortened case life and increases the need for case trimming.

Another consideration is neck tension. Rifles sometimes display preferences in how tightly or how lightly projectiles are gripped. The way a case neck releases a bullet—or resists releasing it—to the rifling affects not only its presentation in the throat of the chamber but also how consistently the

propellant ignites and burns. Thus the ability to control and vary neck tension is an advantage to detail-conscious handloaders.

Many match shooters prefer their case necks to be only 0.001 inch undersize. For hunting or defensive purposes, cases that are 0.002 inch to 0.004 inch undersize can sometimes make for a more robust cartridge that better withstands the rigors of field use.

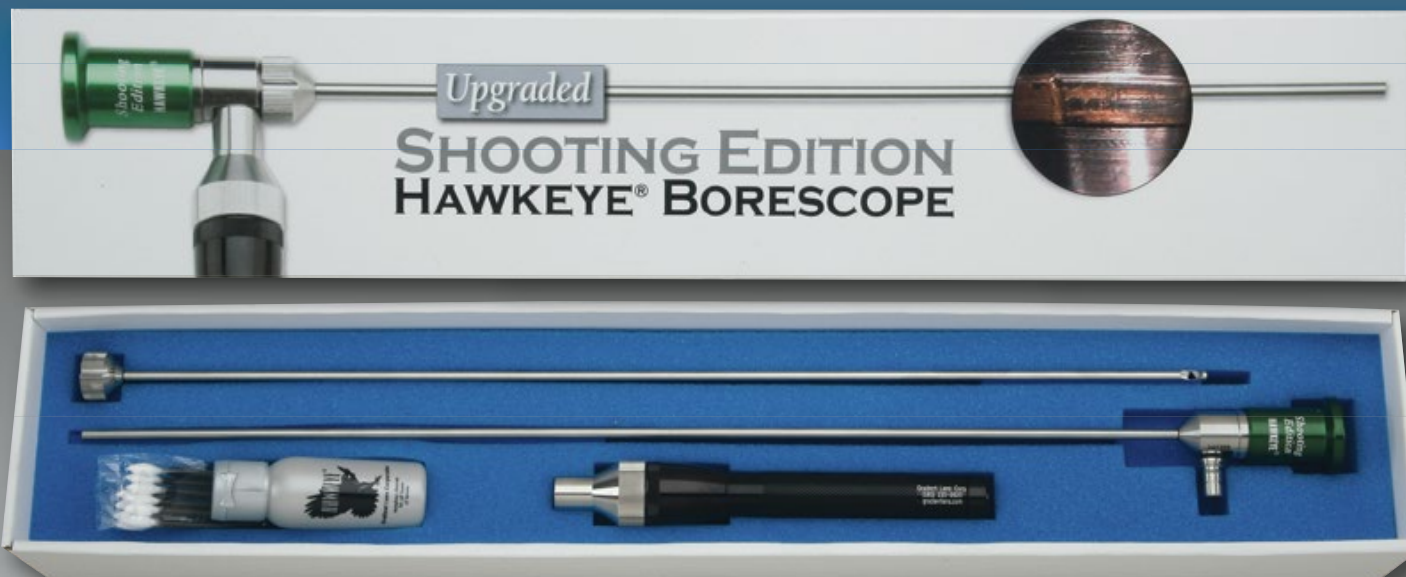
Various reloading companies offer sizing dies that address the neck tension/sizing method issue, but the one I'm currently infatuated with is Hornady's Match Grade Rifle Die. It addresses or enables the shooter to address and control all of the mentioned variables of resizing.

Simply put, the Match Grade Rifle Die is available in two types—full-length sizing and neck sizing only, both of which use interchangeable bushings (not included; order separately) that allow the user to control exactly how much the case neck is reduced when sized.

To my great glee, this method compresses the neck only the amount necessary to properly grip the projectile with the tension that the shooter



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determines is correct and thus does not overwork the brass and shorten its life. A nice side effect of that method is that since the brass has not been over-compressed no expander ball is needed. With no expander ball, cases are not stretched, and you also don't need to lube the inside of the necks (a procedure that can lead to inconsistent neck tension).

## SPECIFICATIONS

### HORNADY MATCH GRADE BUSHINGS

<b>CALIBERS</b>	.223 Rem., 6mm PPC, 6mm BR, 6x47 Lapua, 6.5x47 Lapua, 6.5 Creedmoor, .308 Win.
<b>PRICE PER DIE SET</b>	\$100 (6x47 Lapua, 6.5x47 Lapua, 6.5 Creedmoor)
<b>PRICE PER BUSHING SIZE DIE ONLY</b>	\$53 (.223 Rem., 6mm PPC, 6mm BR, .308 Win.)
<b>PRICE PER BUSHING</b>	\$22
<b>MANUFACTURER</b>	Hornady, <a href="http://HORNADY.COM">HORNADY.COM</a>

Attentive handloaders will argue that, thus sized, any discrepancy in neck wall thickness will introduce inconsistencies in the internal roundness of case mouths, and they are correct. However, such discrepancies seem to have little effect, and the use of quality brass (which you're sure to be using if you're obsessive enough about accuracy to worry about neck tension) minimizes those discrepancies to almost nothing. Neck turning your cases eliminates potential discrepancies entirely, but I haven't found doing so necessary in most cases.

It's worth noting that the die ships with both Hornady's elliptical expander ball and an undersize decapping pin holder, so the choice of whether to use an internal expander is yours.

According to Hornady's Ben Syring, to determine the correct size bushing, measure neck wall thickness with a ball micrometer, multiply the result by two, add the diameter of the bullet and subtract 0.002 inch. The result is the correct size bushing.

After spring-back, which occurs in the opposite direction than when using an internal expander, necks will be about 0.001 inch undersize—just what match shooters want. If you want a more robust hold, or if your rifle proves to prefer it, use the next smaller bushing.

A simpler way—and the best way if you don't have a ball micrometer—is to seat a bullet into a sized case from the particular batch of brass you plan to reload, then measure the outside diameter of the case neck with the bullet contained in it and reduce that measurement by 0.002 inch. The resulting measurement gives you the correct bushing die size to start with.

My only gripe with Hornady's Match Grade bushing dies is that they aren't available in enough calibers. Currently, those available are for cartridges commonly regarded as precision and/or competitive-type numbers. Hopefully, the line will expand with time to include more common cartridges.



# Coming Up Aces

**IWI'S MODERNIZED GALIL, THE ACE, PROVES TO BE A REAL WINNER.**

**I**n a world seemingly awash with AR-15s, IWI US—the U.S. subsidiary of Israeli Weapons Industries—has made it a point to march to the beat of its own drum. The company first caught the attention of shooters when it offered the Israeli Defense Force's replacement for the M16: a tough bullpup called the Tavor. Short, reliable and accurate, the "Hebrew Hammer" quickly became popular among shooters looking for a modern alternative to an AR. IWI shook things up again this past October when it unveiled a modernized Galil with well laid-out controls, effective 7.62x39 chambering and an edgy attitude.

Yisrael Galili and Yaacov Lior originally developed the Galil in the late 1960s to replace the 7.62x51 FAL rifles then in service. Rather than designing something entirely new, Galili and Lior based their work around Kalashnikov's AK system.

Adopted by the Israeli Defense Force in 1972, the 5.56x45 Galil assault rifle was an incredibly tough and reliable design. It featured a heavy Finnish-pattern milled steel receiver, beefy folding stock, night sights, folding carry handle, bipod and even a bottle opener. Advanced for 1972, the gun tipped the scales at a portly 11 pounds loaded. So despite being a



A modern take on a classic Israeli battle rifle, the new Galil ACE will be available in both carbine (shown here) and SBR platforms. Reliability was excellent.

5.56x45 caliber assault rifle, it actually weighed more than the 7.62x51 FAL it was replacing.

Forty-two years later, the Galil—in the form of IWI's ACE—not only is still with us but also has evolved into a much more user-friendly design, although the heart of the ACE remains tried-and-true Kalashnikov. The carrier-controlled rotating bolt, long-stroke gas-piston system and trigger mechanism are all borrowed from the AK, which means it's tough and reliable just like the original Galil.

But beyond the operating system, the rest of the rifle has been significantly updated. The new ACE partially addresses the Galil's weight problem with a modern hybrid receiver consisting of a machined upper mated to a polymer lower subassembly that houses the pistol grip, magazine well

and magazine release. This helps reduce weight below eight pounds.

That change makes the ACE lighter and handier than the original Galil. It also hits harder, thanks to its 7.62x39 chambering. Performance of this classic Soviet cartridge has been significantly improved by loads introduced by Hornady and Winchester.

When teamed with modern expanding projectiles, the 7.62x39 is a match for the .300 BLK. Plus, the ACE feeds from standard AK magazines, so you don't need expensive proprietary magazines.

The controls on the ACE also have been improved. Gone is the Galil's upturned charging handle, which is difficult to operate when optics are mounted. The reciprocating charging handle on the new ACE is located on the left side of the receiver. Putting it





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here makes it both easy to reach and manipulate. The redesign incorporates a spring-loaded cover that seals the slot the handle runs in. With the elimination of the charging lever slot on the right-hand side, the system is basically sealed from foreign debris and dirt.

An easy to operate safety lever is located on the left side along the pistol grip. Simply thumb it forward to place the rifle on Fire. In addition a safety lever is located on the right side of the receiver, above the trigger.

Sights comprise a protected front post and a simple protected rear aperture mounted at the rear of the top cover. However, since this is the 21st century, a 1913 optics rail runs the length of the top of the rifle. If you need to mount a white light or other accessory, the fore-end consists of an aluminum 1913 tri-rail system. This is cleverly hidden beneath comfortable rail covers.

A unique feature is the ability to plumb a small pressure switch and cable into the rail system then slide the cover back into place. The pressure switch may then be accessed through the rail cover.

The rifle features a chrome-lined,

cold-hammer-forged barrel with a 1:9.5 twist and 5/8x24 muzzle threads for mounting aftermarket muzzle devices and sound suppressors. The carbine sports a robust collapsible stock, allowing quick changes of length of pull. Better still, it also folds to the side, further reducing length for compact storage. A clip-on cheek riser comes is included to enhance the cheek weld when using magnified optics. Stripping the ACE is simple and straightforward, like a Kalashnikov or Galil.

I had a chance to shoot a 16-inch carbine and an 8.3-inch SBR. Both performed very well with zero issues of any kind—no small feat considering how many other shooters had fired it at the event I attended. Magazines—both Com Bloc steel and polymer—inserted easily into the mag well and locked securely in place. The left-side charging handle is well placed and easy to operate. Cartridges chambered smoothly without issue.

The ACE balances well and shoulders easily. I found the fore-end very comfortable in the hands with the rail covers installed. The iron sights are easy to pick-up and index nicely on target. Trigger pull is smooth and fairly light with a clean break. Recoil is easy to control and shot to shot recovery typical of 7.62x39 Kalashnikovs.

I have yet to fully test the ACE for accuracy. However, I did have the chance to fire it from standard field positions at 100 yards. Both models knotted up nicely in the center of the steel Action Target silhouettes available.

IWI US is going to offer both the carbine (ACE 32) and the SBR with an arm brace. I would not be surprised if it outsells the carbine. Price had not been set at press time, but the company says it will come to market at a price lower than the Tavor, which means it will sell for less than \$1,600.

My thoughts? The ACE will be a factory gun with all the bells and whistles custom 'smiths have been adding to high-end AK builds and then some. That's pretty exciting. The pistol is expected to be available soon after you get this magazine with the carbine to follow about a month later.

THE LAST WORD

Continued from page 72

The early 6.5mm cartridges were used in this country, but only the 6.5x55 Swedish Mauser garnered a lasting following. It comes and goes and is still loaded, but cannot be called popular. In the teens, Charles Newton introduced his .256 Newton, actually a 6.5mm. It was loaded for some years but never caught on. Fast-forward 40 years to the .264 Win. Mag. Introduced in 1958, it took off like a rocket. Everybody wanted one, and many gun writers touted it. Then it fizzled. It was over-bore capacity, was said to quickly erode barrels, needed a 26-inch tube and didn't quite reach the original published velocities. But its real death knell was Remington's introduction of the 7mm Rem. Mag. in 1962, admittedly a more efficient and versatile cartridge.

The .264 hangs on, barely, but today several milder 6.5s, perhaps most notably the .260 Rem., 6.5-.284 and 6.5 Creedmoor are garnering small but loyal followings. The newest 6.5mm is the super-fast .26 Nosler, the fastest factory 6.5mm ever. I won't go out on a limb and predict an American renaissance for the 6.5mm, but these are encouraging signs.

I also won't go out on a limb and champion any particular caliber or cartridge. I think the days when a gun writer could make effective use of what, really, was a gimmick are over—even if guys like Askins, Keith, O'Connor, Page and Whelen genuinely believed their personal gimmick calibers were the very best. Today we have so many great cartridges, and there is so much overlap that it seems almost silly to suggest one is substantially better than another.

For me, it's always been fun to use a variety of cartridges, understanding that there are now too many for anyone to have even passing knowledge of all of them. Some cartridges I like a lot are extremely popular. Others are not. For instance, I really like the 8mm Rem. Mag., fantastic for elk and the full run of African plains game. I also have a special fondness for the .264 Win. Mag. But I seriously doubt I have the power to make either popular.

SPECIFICATIONS	
IWI US GALIL ACE	
TYPE	long stroke gas-operated semiauto with rotating bolt
CALIBER	7.62x39
CAPACITY	accepts standard AK detachable magazines
BARREL	16 in. cold hammer forged, chrome lined, 1:9.5 RH twist
OVERALL LENGTH	35 in.
WEIGHT	7 lb., 10 oz.
CONSTRUCTION	machined steel upper, polymer lower
FINISH	phosphate
FURNITURE	side-folding collapsible stock, tri-rail handguard
SIGHTS	protected front post, aperture rear with full length 1913 rail
PRICE	not available
IMPORTER	IWI US, IWI.us



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INTRODUCING A NEW COMPANY AND A NEW RIFLE LINE BUILT  
ON THE EXCELLENT MODEL 704 ACTION.



**O**kay, so you've probably never heard of Legendary Arms Works. There's no reason you should have. The company was created in December 2013, and the first rifles were just coming off the line in late 2014. On the other hand, if you're a reader of this magazine, it's likely you *have* heard of Mark Banner. And if you're a student of bolt guns, you've probably heard of Ed Brown's

amazing Model 704 action. Here's how those dots connect.

Ed Brown is probably best known for his work with 1911 pistols, but years ago he designed the Model 704 bolt-gun action. He built rifles on this action at his Columbia, Missouri, facility—but not all that many since his primary business was and is 1911 pistols and parts.

But for those who care about bolt actions, the Model 704 action can be

considered one of the best ever designed. It's not complex: a round action that's partly a Mauser clone in that it has two forward dual-opposing locking lugs and a mechanical blade-type ejector, and it's a controlled-round-feed action. It is also a Model 70 clone in that it has a Model 70-style, three-position safety at the rear of the bolt, and the spring-loaded extractor snaps over the case rim so a round can be chambered either from the maga-





The author's daughter used a Professional in .280 Rem. on a successful mountain goat hunt. In the field and at the range that rifle and the author's sample in .300 Win. Mag. proved to be winners in handling and accuracy.

zine, pure Mauser style, or by dropping in a single cartridge and closing the bolt.

It does not have the long Mauser claw extractor, but it also doesn't have the small hook extractor of so many modern actions. The spring-loaded extractor is massive, about .450 inch in bearing surface on the rim. The cocking piece and firing pin/spring assembly remove easily for cleaning, and the bolt release is conventionally located on the bottom left of

the rear receiver ring. Bottom metal, the trigger guard and floorplate assembly, are one piece, and the front ring carries a .250-inch recoil lug.

There is relatively little in the M704 action that cannot be seen in other actions past and present, but in sum it is extremely smooth and incorporates a whole bunch of features that serious rifle shooters tend to like. CNC machining is also not new, but its CNC

technology allows the action, machined from 416 stainless steel, to be built at an affordable price.

Mark Bansner and his wife, Roslyn, started building rifles in Adamstown, Pennsylvania, in 1980. Bansner Gunsmithing, their initial business, became Bansner's Ultimate Rifles LLC. Over the course of 30 years, they became one of our most respected rifle makers—and, unlike so many of the curmudgeons in our world, among the most likeable.

I've used a number of their rifles over the years, and they're always good, but more importantly, Mark and "Ros" came to be good friends, the kind of people you can trust and whom you really want to be successful.

As a companion business, Bansner's High Tech Specialties rifle stocks earned its own reputation for creating some of the finest synthetic stocks available, made from epoxy resins with structure urethane foam in butt and fore-end. The result is a stock that is light and strong, typically in American classic style with a straight comb, slender wrist and elegantly tapered fore-end. Further, they're pillar bedded with epoxy rather than aluminum or steel.

The final piece of this puzzle comes in the form of Dave Dunn. When I met Dave he was in the financial management business, but he was always a gun nut of the highest order. Just a few years ago he bought the Trop Gun Shop in Elizabethtown, Pennsylvania. In the latter half of 2013, Dunn called and asked what I thought about Ed Brown's Model 704 action. I told him I thought a whole of it. As it turned out, Ed was looking to focus more on his core 1911 business, and the next thing I knew, Trop Gun had bought the Model 704 action: the design, the CNC programming and the right to manufacture.

Dave's next moves were to acquire Bansner's Ultimate Rifles and High Tech Specialties and form the brand new Legendary Arms Works, which would use Bansner's team, expertise and rifle stocks to build rifles on the Model 704 action. I spoke to Mark about the arrangement, and while he was a bit daunted by the challenges of manufacturing an action, he explained something to me that I'd really never thought of. As a rifle maker he



had great gunstocks, and he could easily source great barrels, great triggers and so forth. But for 30-odd years he'd fought the battle of the actions, dealing with quality control and concentricity issues that he had to fix but had no control over.

Now, with the excellent 704 action as a foundation and Mark's expertise in building complete rifles, a winner is almost assured.

Perhaps surprisingly, the Legendary Arms Works concept is not to build custom rifles but rather to build premium production rifles that offer the majority of features that shooters are looking for without getting wrapped around the axle with a shopping list of options, thus keeping the price competitive with other

premium-quality production rifles.

There are three basic models: the Closer, the Professional and the Big Five. First, let's look at what's the same between the Closer and the Professional. Each is offered in 19 chamberings ranging from .22-250 to .35 Whelen in caliber. It is an eclectic list that includes most of the common and popular cartridges you would expect, but also a few interesting choices: .257 Wby. Mag., 6.5 Creedmoor, 6.5/.284 and .280 Ackley Improved. Maybe not as surprising are three choices from one of my favorite niches, the fast .30s: .300 WSM, .300 Win. Mag. and .300 Wby. Mag.

There are two action lengths: short and full-length. A 24-inch tube is standard, although the .257 and .300 Wby. Mags. have 26-inch tubes. Gray Cerakote is standard across all three lines. Both the Closer and the Professional lack sights but include a matching Talley base; the Big Five has open sights with express rear.

Also standard in the Closer and the Professional is a No. 3 barrel contour, which is slim but not too slim. Barrels are stainless, also with gray Cerakote finish. Triggers are Timney, and stocks are High Tech Specialties synthetics—classic in style—with Pachmayr Decelerator pads, Uncle Mike's sling swivel studs and a 13.5-inch length of pull. The Closer stock is a tri-color: latte, olive drab green and

black. The Professional's color mix is olive drab green, "safari" and black. All receivers are drilled and tapped for the larger 8-40 threads with hole spacing at .860 inch front and rear.

The Closer is the basic model, so it's going to be a bit heavier. It has an unfluted barrel and unfluted bolt. Weight depends on barrel length and bore diameter, but the Closer should weigh around 7.5 pounds. An airline-approved hard case is supplied. Suggested retail? A surprising \$1,600, regardless of chambering.

### Going Pro

The Professional isn't really an upgrade. Everything is exactly the same except it has been lightened up a bit via a fluted barrel and helically fluted bolt. It also sports a removable muzzle brake with thread protector. Weight should average about seven pounds (which is what my test rifles weighed). The suggested retail price of the Professional is \$1,829.

The Big Five, as you'd expect from its name, is a dangerous game version. Once again, pretty much everything is the same except that the length of pull is a bit longer, 13.75 inches (which is better for offhand and shooting off sticks).

The stock is also a tri-color, comprising "café," "safari" and black. Neither barrel nor bolt is fluted, and there is no muzzle brake. Barrels are 24 inches, and

SPECIFICATIONS	
LEGENDARY ARMS WORKS PROFESSIONAL	
TYPE	controlled-round-feed centerfire bolt action w/ hook extractor
CALIBER	.22-250, .243, .25-06, .257 Wby., .260, 6.5 Creedmoor, 6.5-.284 Norma, .270 Win., 7mm-08, .280 Rem., .280 Ackley Improved, 7mm Rem. Mag., .308, .30-06, .300 Win. Mag. (tested), .300 WSM, .300 Wby., .338 Win. Mag., .35 Whelen
CAPACITY	5+1 (standard), 3+1 (magnum)
BARREL	24 in. match-grade fluted, 1:10 twist (as tested), removable muzzle brake w/ supplied thread protector
OVERALL LENGTH	45 in. (brake installed)
WEIGHT	7 lb. (as tested)
FINISH	stainless w/Cerakote finish
STOCK	High Tech Specialties synthetic, American classic style w/o cheekpiece, Decelerator recoil pad
TRIGGER	Timney adjustable; 2.5 lb. pull (measured)
SIGHTS	none; drilled and tapped for scope; bases included
PRICE	\$1,829
IMPORTER	Legendary Arms Works, <a href="http://LEGENDARYARMSWORKS.COM">LEGENDARYARMSWORKS.COM</a>



Top, the Legendary Arms Works Professional in .300 Win. Mag. with Leupold VXIII 4.5-14X; bottom, the Professional in .280 Rem. with Leupold VX6 2-12X, both in Talley mounts.





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the contour is a much heavier 5A, except for the .458 Lott, which is a No. 6 contour (heavier barrels to get the weight up a bit against recoil, good idea). The Big Five will weigh about nine pounds.

All Big Five rifles have express-style open sights, and receivers are drilled and tapped for scope use. There are six caliber offerings in the Big Five: .338 Win. Mag., 9.3x62, .375 H&H Mag., .416 Rem. Mag., .404 Jeffery and .458 Lott. Suggested retail is \$2,743.

Initially, all Legendary Arms Works rifles have right-handed actions, but because Mark Bansner shoots left-handed, I suspect there is hope for those of us on the southpaw side of the fence.

At this writing, I have seen neither a Closer nor a Big Five. The two Professionals I have seen are both from the first batch of newly minted actions—one in .280 Rem., the other in .300 Win. Mag. At the time they were built, stock colors weren't yet standardized. I would not call these inexpensive rifles, and we all know there are perfectly serviceable bolt-action hunting rifles at one-fifth their cost. I would say that these rifles are a lot of gun for the money and handle like a dream.

Tolerances are tight, the actions are extremely smooth, and the follower is beautifully machined, which undoubtedly contributes to incredibly smooth feeding. I have always been a big fan of the Model 70-style three-position safety, so for me that's a plus. Likewise, the one-piece bottom metal and Model 70-style floorplate release. These two rifles were supplied with Talley bases and rings, an attractive as well as effective choice. The .280 was mounted with a Leupold VX-6 2-12X, the .300 with a VX-3 4.5-14X.

I took both rifles to the range, but I must admit that, at least initially, I didn't intend to hunt with both of them. The .280 was for daughter Brittany to use on a Rocky Mountain goat hunt in northern British Columbia. I didn't actually need another goat, so I had tags for mountain caribou and black bear.

After a horrible climb she killed a wonderful goat with the .280 and a 139-grain SST in a Hornady Superformance load. The shot was only 120 yards, so neither the rifle, the cartridge nor the shooter's capabilities were stretched

in any way. As for me, the caribou just weren't in yet, and we saw only one black bear, which got chased out of the country by a grizzly. So I carried the Professional .300 Win. Mag. for 10 days, but other than checking zero, I never fired it on that hunt. It was extremely pleasant to carry, and I sure wasn't worried about its capabilities had I happened to get a shot.

Both rifles performed extremely well on the range. I didn't have much of a load selection for the .280, but it shot right around an inch with the Hornady SST Superformance load. The .300 did a bit better. It stayed right at an inch with the 150-grain Hornady GMX, about the same with the Superformance 180-grain SST, and was a touch more accurate with handloaded 175-grain Berger VLD bullets.

Trigger pulls on both rifles were marvelous; both measured 2.5 pounds—exactly what the gun's literature promised. Brittany elected to keep the muzzle brake on the .280, but I removed it from the .300. The joint was so clean, so difficult to see where it threads onto the barrel, that the muzzle brake doesn't look detachable.

So if you hadn't heard of Mark Bansner or the 704 action, now you have. And

if you haven't heard about Legendary Arms Works, now you have. I have a feeling you will hear much more about these entities that have now joined. Check them out at [LEGENDARYARMSWORKS.COM](http://LEGENDARYARMSWORKS.COM) [Ed. note: At press time, the site didn't yet contain information on the rifles, although it did have an email address for contacting the company for more info.] In the meantime, the fall hunting season isn't all that far off, and I'm looking forward to having a bit more luck with that .300. ■



Legendary Arms Works rifles are built on the Ed Brown-designed Model 704 action. It's a round-bottom action with a Winchester 70-type three-position safety. Bolts on the Professional model are fluted; other models are not.



While the Model 704 action features a controlled-round-feed bolt, it doesn't have a claw extractor like Mauser and Model 70 bolts do. However, its hook extractor is large—0.250 inch—for sure extraction.



The rifle ships with a muzzle brake and, if you're not a brake fan, a thread protector. Barrels on the Closer and Professional models are gray Cerakote-finished stainless steel. The Professional's barrel is fluted.

## ACCURACY RESULTS

### LEGENDARY ARMS WORKS PROFESSIONAL

.300 WIN. MAG.	Bullet Weight (gr.)	Muzzle Velocity (fps)	Standard Deviation	Avg. Group (in.)
HORNADY GMX	150	3,320	23	0.98
HORNADY SUPERFORMANCE SST	150	3,185	27	1.15
BERGER VLD*	175	3,090	14	0.83

NOTES: (\*Handload) Accuracy results are averages of five three-shot groups at 100 yards off a Caldwell Lead Sled. Velocities are averages of five shots measured 10 feet from the muzzle on a Chrony F1 chronograph.



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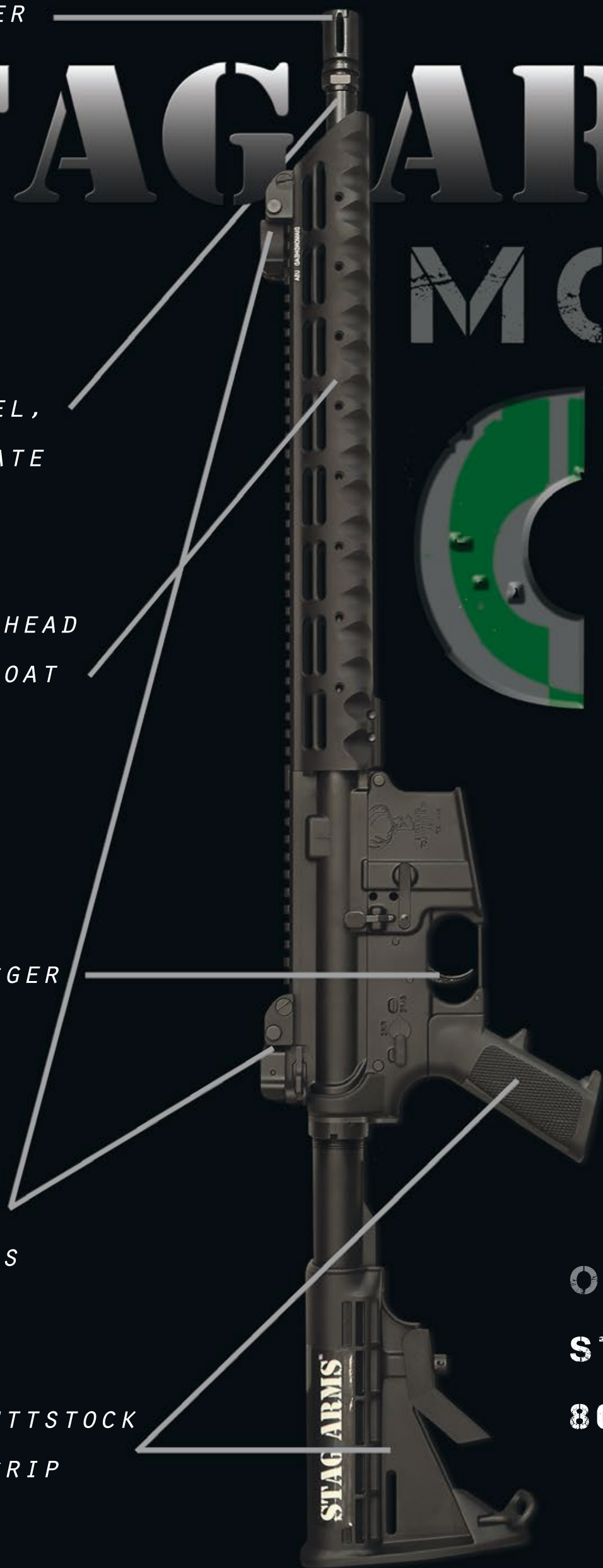
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# BACK TO BASICS

RUGER'S NEW DIRECT-IMPINGEMENT AR-556 IS AN AFFORDABLE RIFLE WITH SOME GREAT NEW FEATURES.

by James Tarr



Photo by Michael A. Schuetz





**I**'m a man who can admit when I am wrong—no matter what my ex-wife might say. When I heard Ruger was introducing a direct-impingement AR-15, I mentioned to a colleague it would likely be both a little too heavy and a little too expensive for what the current market can bear, as I feel is the case with the company's gas-piston AR-15 line. News flash: I was completely wrong. With its AR-556 Ruger has given shooters the AR-15 they want.



Currently, the most popular AR-15 configuration is a 16-inch flattop model with a carbine-length gas system and collapsible stock, commonly known as the M4 style, as it most closely resembles our military's M4 carbine. That might not be the kind of whiz-bang AR-15 you see on all the magazine covers, but it's the best selling of any AR-15 type across the country. And Ruger, as much as any gun company, knows its customers.

In its advertising, Ruger admits that its gas piston SR-556 "is not a cheap date"; the least expensive SR-556 model is \$1,375, and most are \$1,995. Considering how flat gun sales have been for the past year, introducing the new AR-556 at a suggested retail of only \$749 is nothing but smart. Ruger is able to do this because it is a big company and makes ev-

everything on the rifle in-house, including some new parts you might be surprised to see. And here's something else. This is the first firearm from Ruger designed, engineered and built completely in its new Mayodan, North Carolina, facility.

The AR-556 features a 16.1-inch, cold hammer-forged barrel of 4140 chrome-moly steel. Ruger says it has a medium contour, but to my eye it appears to be a hair thinner than most of the medium-weight barrels on the market. I think that's a good thing.

Under the handguard the barrel has a gentle taper, and as a result, total weight of the rifle is 6.5 pounds, which is exactly what it should be on a general purpose AR-15. If you're looking for specifics, under the handguard the barrel is .850 inch, under the gas block it is .750 inch

and forward of the gas block to the flash hider it is .700 inch.

The six-groove barrel features a 1:8 twist. This twist has been found to be the best for the widest range of bullet weights (from 35 to 77 grains). The rifle has a 5.56 NATO chamber, so it will handle the more common .223 Rem. ammo as well as the slightly hotter 5.56 NATO round (which will be most of the surplus military ammunition). The barrel has M4 feed ramps for improved reliability.

The flash hider on the end of the barrel has the distinctive Ruger look. It has five slots and is just a hair shorter than the standard military A2 flash hider. Unlike the A2 hider, it does not have a closed bottom, so if you do any shooting from the prone in a dusty area you might find yourself kicking up a cloud. The muzzle has standard 1/2x28 threads, so it will accept any standard AR muzzle device.

The metal parts on the rifle display an even satin black finish. Officially, the finish is matte black oxide on the barrel and hard-coat anodizing on the receivers, but it all matches and looks good. You'll see the Ruger logo discreetly everywhere—on the lower receiver, upper receiver, stock, pistol grip, rear sight and handguard.

The front sight/gas block on the AR-556 might look a little different to AR-15 fans. It is not a mil-spec forging but rather a refined design that's machined in-house at Ruger. It is F height, so it will co-witness with optics. The front of the sight tower is serrated. The people at Ruger say this is to reduce glare, but I can't say I've ever had a problem with glare off the front sight post of an AR. It looks cool,



The rifle features a beavertail pistol grip of Ruger design and an oversize trigger guard for use with gloves. Note the lack of a gap between the grip and the guard.



Significantly, this is the first rifle to be designed, engineered and manufactured at Ruger's new facility in Mayodan, North Carolina.

## ACCURACY RESULTS

### RUGER AR-556

.223 REM.	Bullet Weight (gr.)	Muzzle Velocity (fps)	Standard Deviation	Avg. Group (in.)
BLACK HILLS TSX	50	3,226	18	1.69
WOLF GOLD FMJ	55	3,065	47	2.26
WOLF STEEL CASE SP	55	2,877	55	2.33
HORNADY V-MAX	55	2,911	28	1.88
BLACK HILLS HP	77	2,592	25	2.02

**NOTES:** Accuracy results are the averages of four five-shot groups at 100 yards from a sandbag rest. Velocities are averages of 10 shots measured with an Oehler Model 35P 12 feet from the muzzle. FMJ, full metal jacket; HP, hollowpoint; SP, softpoint



though, and further helps to set the Ruger apart in a crowded market.

The front sight tower/gas block also features a bayonet lug on the bottom, as well as a QD sling socket, which I thought was a very smart feature. The front sight is adjustable for elevation, and a tool to do that is included with the rifle.

Paired with the fixed front sight is a pop-up polymer rear sight I first thought was a Magpul. But remember Ruger makes the entire gun in-house. In fact, the rear sight is Ruger's Rapid Deploy rear sight. It pops up by depressing a serrated button on the left side of the sight body. The sight features a single aperture that is click adjustable for windage by a knob on the right side of the tower.

Ruger started offering both front and rear Rapid Deploy sights on the relatively new SR-556E model. They seem to be just as well-made and designed as the popular Magpul MBUS sights and are available for sale on the Ruger website. As of right now, the new pistol grip is not available for sale separately, but several of the employees I talked to at Ruger are in favor of that.

Ruger supplies one Magpul PMag with the rifle. While the military is still issuing aluminum magazines, in truth the Magpul PMag is the AR magazine standard against which all others are currently judged and has proven itself in combat around the world. The polymer buttstock is an M4-style manufactured by Ruger, and it rides on a six-position mil-spec buffer tube.

The round handguard on the AR-556 is the narrower, original design seen on CAR-15s. Current military M4s sport fatter handguards because they have a double aluminum heat shield inside to protect the user's hands during full-auto fire. The Ruger handguard is constructed of heat-resistant glass-filled nylon. It fits into a standard round metal handguard cap at the front, but if you look closely, you'll see the barrel nut and delta ring are a new style from Ruger.

Apparently as fed up as the rest of America at how difficult is it to remove a handguard, the engineers at Ruger designed their own delta ring and barrel nut. There is a patent pending on their new barrel nut, and to remove the hand-

guard all you need to do is unscrew the polymer delta ring toward the receiver. When it stops moving, the rear of the handguard is clear of the ring, and the upper and lower halves will pop right out.

Compare that to the standard spring-loaded delta ring. If you want to swap out handguards with one of those, you'll need tools or three hands and a monkey. All standard two-piece carbine-length handguards will fit on the rifle, too. Why somebody didn't design a rational delta ring like this 40 years ago I have no idea, but it is simply genius.

The pistol grip is obviously not a military-style A2, and at first glance I thought it might be an aftermarket item, but it is in fact one of Ruger's own design. It has a beavertail for optimal trigger reach and a slight palm swell.

The pistol grip is paired with an oversize polymer trigger guard. This type of trigger guard is useful if you're wearing

## SPECIFICATIONS

### RUGER AR-556

TYPE	AR-15
CALIBER	5.56 NATO
CAPACITY	30-round PMag supplied
BARREL	16.1 in., 4140 chrome-moly, 1:8 twist w/Ruger flash hider
OVERALL LENGTH	32.25–35.5 in.
WEIGHT	6.5 lb.
RECEIVER	7075-T6 billet aluminum
FURNITURE	Ruger collapsible M4-style stock, beavertail pistol grip, glass-filled nylon handguard
TRIGGER	single stage, 7.75 lb. pull (measured)
SIGHTS	Ruger Rapid Deploy rear; fixed front adjustable for elevation
PRICE	\$749
MANUFACTURER	Ruger, <a href="http://RUGER.COM">RUGER.COM</a>



The front sight/gas block is an F height sight that's serrated on its face, and the rear is Ruger's own Rapid Deploy sight.



Ruger's patent-pending delta ring simply screws toward the receiver, allowing easy removal of the handguards—a welcome design feature.



## BACK TO BASICS

gloves, and most people think they look better than the standard straight trigger guards. There is no gap between the pistol grip and trigger guard to pinch your middle finger.

Fit between the upper and lower receivers was tight, and I had to use a

punch to move the rear takedown pin the first time I took the rifle apart. Receivers are made from 7075-T6 aluminum forgings. The bolt and carrier came from the factory well-lubed with light oil.

I would have been happy if the Ruger engineers had worked the same kind

of magic with the trigger group as they did with the delta ring. Trigger parts are standard GI in design and finish, which means the rifle sports a typical GI single-stage trigger: heavy and gritty. Trigger pull on my sample was 7.75 pounds, and I have no doubt accuracy suffered as I struggled to hold the rifle still while pulling the trigger. But trigger pull was the only complaint I had with the rifle. I'm guessing that with a crisp match trigger my group sizes might have been reduced by a third.

Ruger machines its own bolt carriers and bolts. The inside of the carrier is chrome plated, as is the inside of the gas key, which is properly staked. For those of you who worship at the altar of mil-spec, the bolt is made of 9310 steel, shot peened and pressure tested. In fact, Ruger proof tests the bolt and barrel together.

Gas-piston AR-15s stay cooler and cleaner at the chamber, and that was Ruger's big selling point with the SR-556. I prefer Eugene Stoner's original direct-im-



While the heavy and gritty single-stage trigger didn't do the rifle any favors in terms of benchrest accuracy, the rifle proved a capable and fun gun to shoot in field conditions.

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pingement design. If your gun is properly made and lubed, it should run just fine right out of the box for many hundreds if not thousands of rounds between cleanings. To me, the added weight and expense of a piston AR-15 do not make up for the reduced fouling, and by moving to a direct-impingement gun Ruger is able to sell the AR-556 for substantially less than its SR-556. The longer aluminum railed handguards on the SR-556 add cost and weight as well, and most AR buyers don't need or use them.

If you read gun magazines you'll have seen all the experts drooling over AR-15s with mid-length gas systems, which are two inches longer from receiver to gas port than carbine-length systems. Mid-length gas systems shoot a little softer and have a longer inherent life due to less wear on the moving parts.

So why would Ruger—which has a reputation as being expert at finding out what its customers want—make an AR-15 with a carbine-length gas system when “everybody” knows the mid-length gas

system is better? Well, while gun writers and competition shooters have been extolling the virtues of the mid-length gas system for several years, the vast majority of the AR-buying public has never heard of it. And the fact is that the carbine-length gas system in ARs works just fine—as it has for decades.

### At the Range

The AR-556 ran without a hitch. While the trigger was a hindrance to accuracy testing, it didn't slow me down too much when I was just having fun, hammering silhouettes at conversational distances. The rifle comes with a flattop, and as I consider iron sights backups to an optic, I mounted a Trijicon SRS red dot on the AR-556 when it came time to have some fun. (Ironically, the Trijicon costs more than the rifle.)

When it comes to controllability and shootability and fun (especially for young or new shooters), I'm not sure there's another design on the market that can beat a 16-inch AR-15, unless you're talk-

ing a .22 rimfire. The first time I took my girlfriend shooting, I put her behind an AR-15, and my son can shoot one all day long without it hurting his shoulder.

Considering we're talking about a rifle design that when loaded with suitable ammo is viable for self-defense, competition, target shooting and hunting animals up to the size of whitetail deer (where legal), the AR-15 truly is America's rifle.

And despite the attempts of some to demonize it as some kind of “fringe” rifle, our own Dave Fortier lives smack dab in the middle of Kansas farm country and reports that the most common “farm” rifle he sees bouncing around in pickup trucks today isn't the traditional lever-action .30-30 but rather an M4-style AR-15.

With the AR-556 Ruger has given America exactly what it wants: a solid U.S.-made basic AR-15 with everything you need and nothing you don't at an affordable price—with a few unique features that show it is unmistakably a Ruger.

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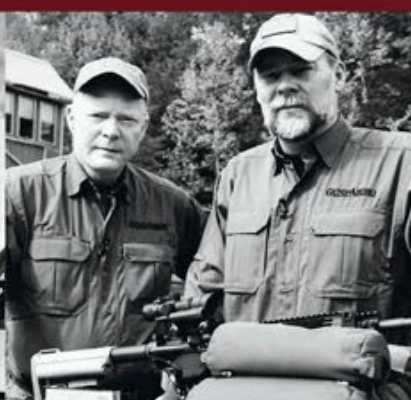
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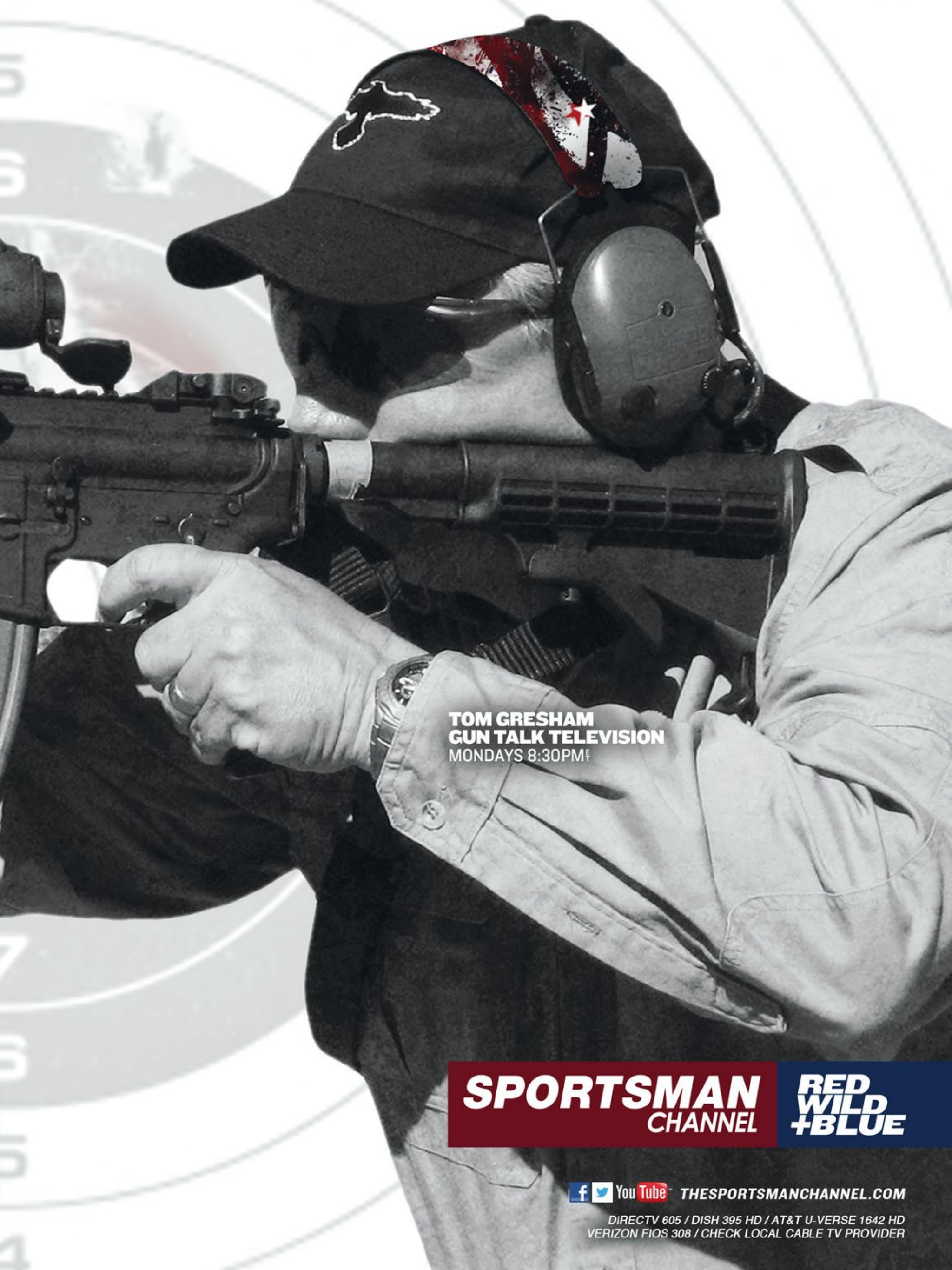


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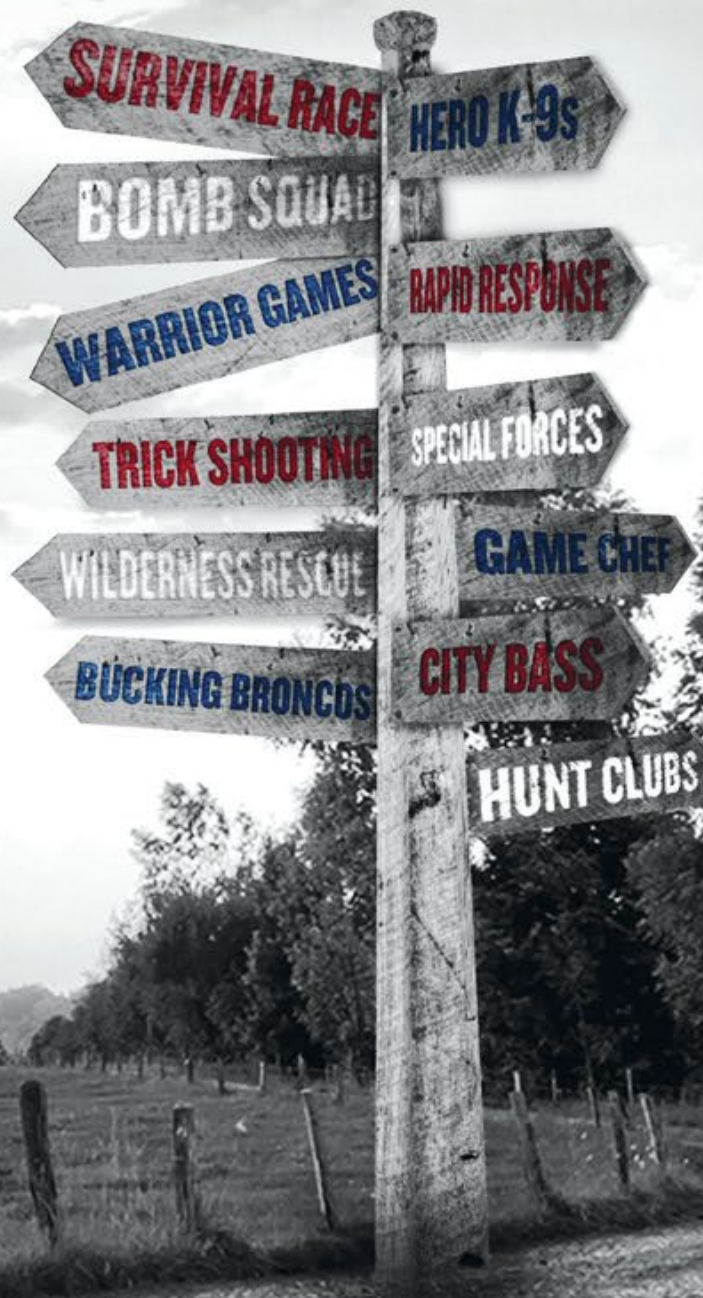
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# THE TRUTH ABOUT EFFICIENCY

THE TERM GETS BANDIED ABOUT IN TODAY'S WORLD OF CARTRIDGES, BUT IT'S NOT AS STRAIGHTFORWARD AS YOU MIGHT IMAGINE.

by Brad Fitzpatrick

**B**allisticians and rifle cranks love the word “efficiency,” and it’s become a common part of our vernacular. We love a specific rifle cartridge because it’s so efficient. We purchase a rifle chambered for a new round because it’s more efficient than what we were hunting with last year. The term has become a sales pitch for cartridges in much the same way that the term “reliability” sells new cars, but how well do we understand the concept of cartridge efficiency—and how does it relate to energy, trajectory, pressure and a host of other interconnected factors that come into play every time we punch a primer?

Efficiency is a tricky subject, and when labeling a cartridge as “efficient,” we must remember that there are a number of factors that can affect overall cartridge efficiency. Most shooters know certain cartridges work better with certain powders. This seems simple enough, but some shooters give credit to a cartridge for the work of the propellant.

When ammunition companies switched from blackpowder to smokeless propellants, the velocity and energy produced by the .30-30 Win. jumped

dramatically. Was the .30-30 suddenly a more potent cartridge? You bet it was, but switching powders accomplished this rise in velocity and energy. Likewise, Hornady’s Superformance ammunition is considerably faster than most traditional factory ammo, but that’s a result of Hornady’s use of a proprietary powder. They didn’t change the .30-06; they just gave it a boost.

This may seem like basic information, but discussions on efficiency can sometimes turn into a bad sketch comedy where misconceptions and misinformation leave everyone confused and discombobulated. First, and this is important, efficiency is relative to propellant. What works in one round may not work for another. That’s important to understand. Forty grains of IMR 4350 doesn’t burn at the same rate that 40 grains of Reloder 25 does, so it’s important to keep things relative.

Like with any good science experiment, we have to keep the variables the same. It won’t do us any good to compare the .243 Win.’s ability to push an 80-grain bullet at 3,000 fps in front of 46 grains of IMR 7828 with the .300 Wby. Mag.’s capacity to launch a 150-grain



bullet at 3,363 fps with 86 grains of Reloder 22. That'd be like saying a Rolls Royce jet engine is more efficient than a Briggs and Stratton because it can fly a jet to Switzerland. Power alone doesn't equate to efficiency.

We must also take into account variables such as burn rate. Load a hot, long-cased magnum with a powder that burns too fast and you're never going to see the results you could achieve with a slower-burning propellant. Propellant choice is variable, and good handloaders understand that they have to match the cartridge with the right powder to effectively compare efficiency.

The one variable that remains constant is the design of the case.

The standardized case for a .30-06 has retained exactly the same dimensions for the last hundred-odd years, and the



One of the most dramatic examples of efficiency differences based on case design is found in the .30 T/C (l.) versus the .30-06. Even though it's much smaller, the T/C round nearly matches '06 velocities with similar weight bullets.

primary factor behind how "efficient" a cartridge is boils down to one thing: case architecture. To understand efficiency, you truly must have a handle on how rifles cases are designed and how changes to a design will alter things such as burn rate and compression. Interior dimensions, the slope of the shoulder, the overall length and other factors play into overall powder column burn. Case design and efficiency go hand-in-hand—period.

It's generally assumed that, with all things being equal, a larger case capacity reduces overall efficiency. Take a look at the accompanying chart where I have matched several 7mm loads and their efficiency with each load in feet per second per grain of powder—one way to measure efficiency. Case capacity gets larger as you go down the list. Consequently, velocity goes up (as does energy) but efficiency drops in every case.



The 7mm Rem. Mag. case (r.) will hold more powder and push a bullet faster, but it is less efficient than the .280 Ackley. You have to ask whether the boost you usually get from bigger cases is worth the price in recoil.

Generally speaking, larger cases allow for more powder to be stuffed in the load, but overall efficiency goes down. The 7mm WSM and the 7mm Rem. Mag. are a particularly interesting comparison, because while they are very close in overall case capacity (the 7mm WSM holds 83.0 grains of water, the 7mm Rem. Mag. holds 83.2), the 7mm WSM offers a 1 percent increase in efficiency. The similarity in overall case capacity indicates that it is the overall design of the Winchester's case that leads to efficiency.

I ran these comparisons with a couple different powders, and while as I mentioned it's true you could tweak the efficiency of a particular cartridge by matching it up with a particular powder, on an apple-to-apple basis the cartridges with smaller volumes are more efficient.

Winchester's line of Short Magnums (and Super Short Magnums, which have faded away) was designed with efficiency in mind. I contacted Mike Stock, centerfire product manager at Winchester ammunition, and asked him how the case design of the WSMs achieves this increase. According to Stock, the WSM's case diameter and short overall length result in a more efficient overall burn of the powder, meaning that more powder is burned more quickly. This means that there is very little powder that is left unburned, and this allows the WSM cartridges to achieve maximum velocity in shorter barrels.

"Improved airflow efficiency and a large diameter powder column make these cartridges more efficient," Stock said. "A short, fat powder column is so near the primer that you are getting more burn before the bullet leaves the case."

But Stock said a major factor in the efficiency of current cartridges such as the WSMs is at least also due in part to having more powders from which to choose.

"When the .30-06 was designed there were only a few powder options," he said. "Today, there are 30 or 40 more, which allows engineers to match new cartridges with the proper propellant."

According to Stock, magnum cartridges "belch a lot of unburnt powder"



in short barrels. Modern, more efficient loads allow for maximum velocity from shorter tubes, all while staying within pressure limits. From a real-world standpoint, that means hunters can carry a rifle that is lighter and has a shorter barrel and can expect the same results they could only achieve with heavier guns with long pipes only a few years ago. Better efficiency also means cartridges can almost match the trajectory of older magnums with less muzzle blast, recoil and powder.

"You can change powders, bullets and barrel length, but there's nothing you can do to change case volume on a particular cartridge," Stock said. "Modern cartridges are designed around modern powders."

These realizations have led to a change in overall cartridge design during recent years, and if you examine new cartridge designs (the WSMs, Ruger's Compact Magnums, the 6.5 Creedmoor and others), there has been a shift in

cartridge architecture toward wider, straight-walled cases with sharper shoulders and minimal body taper. That's no accident; it is a direct effort toward getting more out of shorter, more efficient cartridges.

The current upswing in long-range shooting and hunting (regardless of what you think of the latter) means more rifle owners are stretching the limits of their guns, and according to Stock, efficiency should be a concern to long-range shooters. At extreme ranges, bullet design is very important, and bullets with a high ballistic coefficient buck the wind better and lose velocity more slowly than bullets with low BCs. But serious long-range shooters need to understand why efficiency is critical because the endeavor requires that you are getting the most out of every grain of powder you're burning.

According to Dave Emary, chief ballistician at Hornady, understanding how case design and propellants affect a

cartridge is critical to selecting the right cartridge. Newer powders offer hunters and shooters options when developing loads, for instance, and improving efficiency should be a consideration for any reloader.

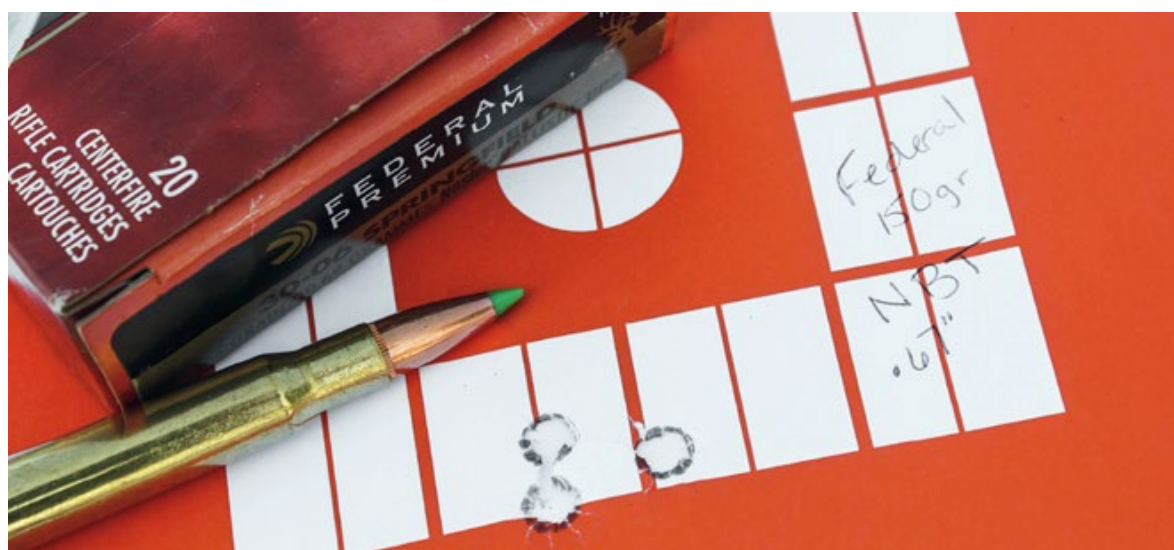
"Basically, efficiency is getting the most push you can for the money," Emary said. He says that over-bored cartridges (high powder capacity with a small bore diameter) tend to produce more recoil, more muzzle blast and require longer barrels and slower-burning powders to work effectively.

"More efficient cartridges are typically more accurate because there is less bullet tip-off when the projectile exits the muzzle, and they are more shootable because there is less recoil and muzzle blast. In addition, high velocity bullets reduce barrel life."

For comparison, he points to the .308 Win. versus the .30-06 Springfield. With bullets up to about 165 grains, the .308 delivers similar velocities with five to seven grains less powder. The advantage of a larger case is that it works better with heavier bullets. Over-bored cartridges shooting lighter bullets are inefficient, and he pointed to the example of the .264 Win. Mag. versus the 6.5 Creedmoor. The larger .264 Win. Mag. requires a long barrel and careful powder selection and produces higher muzzle energy. In addition, lighter calibers are more shootable and are less likely to spew unburnt (read: wasted) powder from the muzzle.

According to Nosler reloading data, the 6.5 Creedmoor will drive a 140-grain .264-inch bullet at 2,672 fps when using a max load of W760 powder. The .264 Win. Mag., using the same bullet and 54.5 grains of the same powder (also a max load), achieves a muzzle velocity of 2,942 fps. The 6.5 Creedmoor is averaging just under 66 fps per grain of powder while the .264 Win. Mag. is making just under 54 fps with a grain of powder. The .264 Win. Mag. load requires 25 percent more powder to achieve a nine percent increase in velocity over the Creedmoor, and the .264 Win. Mag. requires a longer, heavier barrel to do so.

"Everybody thinks about speed, but that's not the only consideration," Emary



Better efficiency doesn't directly translate into better accuracy, but more efficient rounds tend to get their jobs done with less recoil and muzzle blast—which usually means you'll shoot them better.

## 7MM EFFICIENCIES

Cartridge	Bullet Weight (gr.)	Powder Charge (gr.)	Muzzle Velocity (fps)	Velocity Per Grain of Powder (fps)
7mm-08 Rem.	160	44.0	2,650	66.2
.280 Rem.	160	50.5	2,810	55.6
.280 Ackley Improved	160	53.7	2,813	52.4
7mm WSM	160	57.5	2,894	50.3
7mm Rem. Mag.	160	60.0	2,998	50.0

NOTES: All data generated with IMR 4350



said. "A .300 Win. Mag. firing a 150-grain bullet is an extremely inefficient cartridge and is less shootable than smaller rounds."

Understanding efficiency and cartridge design is important for hunters. In any hunting situation you are faced with multiple variables that, when combined, result in the success or failure of a particular shot on game—given that the bullet is correctly placed. Many of these we know and understand; bullet design, shot angle, recoil and muzzle blast (and our ability to handle these without flinching), velocity and even gun weight are critical factors when you are selecting the right gun/load combination for your next hunt. Efficiency plays a role as well.

For most big game hunting at moderate ranges, the efficiency of a cartridge plays a greater role in the result of the hunt than you might initially assume. The 7mm Rem. Mag. is a great deer cartridge, but you aren't getting as much bang for your buck as you might think. The cartridge's larger case capacity

means that it is capable of firing a projectile much faster than a smaller, more efficient cartridge such as the 7mm-08 Rem. But that extra power comes at a price, and because it is more efficient, the smaller 7mm-08 has a trajectory curve that is very close to the magnum out to 200 yards, and it can be built on smaller, lighter rifles that kick less and cost less to shoot.

Mountain hunters should be particularly interested in efficiency, too. When you are climbing and hiking at high elevation, every ounce you carry matters, so you'd better be sure that you aren't carrying any wasted weight. Smaller, more efficient rounds like the 7mm WSM allow you to achieve virtually the same trajectory you would glean from a 7mm Rem. Mag. or Wby. Mag. with a longer case, but they will work on short-action rifles with shorter barrels.

Even dangerous game rifles are benefitting from the new age of more efficient cartridges. Take the .375 Ruger, which was designed by Hornady. Its

shorter, fatter case is more efficient than the long, sloping case of the .375 H&H and can be built on rifles with a standard .30-06-length action. A shorter action means a shorter bolt stroke, and shorter bolt stroke means faster follow-up shots. Ruger and Hornady accomplished this by creating a cartridge that had the same base diameter as the .375 H&H (.532 inch) but had a wider, straighter powder column and a sharper shoulder that increased capacity and efficiency. The result was a short .375 that was more efficient and more powerful than the original.

That's not to say that cartridges like the 7mm Rem. Mag. or the .375 H&H are obsolete. In fact, they're both great choices. Efficiency perhaps isn't the most important consideration when selecting a cartridge, but it is an essential element of cartridge design that is worth bearing in mind when you select a rifle. If you can accomplish what you need with less powder, less recoil and a lighter rifle, isn't that an option worth considering? ■



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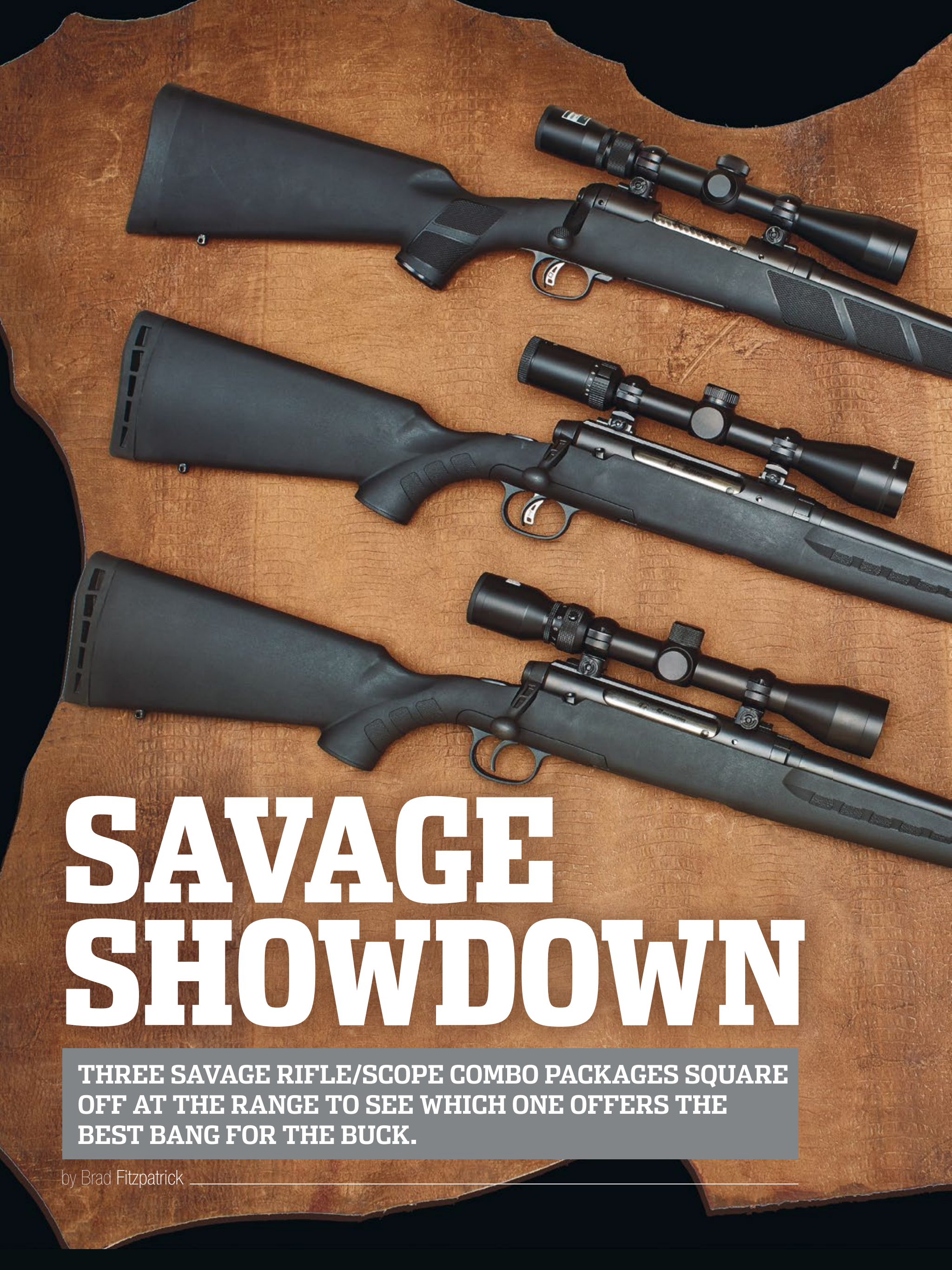
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# SAVAGE SHOWDOWN

**THREE SAVAGE RIFLE/SCOPE COMBO PACKAGES SQUARE OFF AT THE RANGE TO SEE WHICH ONE OFFERS THE BEST BANG FOR THE BUCK.**

by Brad Fitzpatrick





Three Savages, one aim: affordable accuracy. Top to bottom: 11 Trophy Hunter XP, Axis II XP, Axis XP.

**Y**ou rarely hear a shooter or gun writer bemoaning the accuracy of a Savage rifle. The aesthetics have garnered some criticism over the years, and shooters seem to have a love/hate relationship with the company's signature barrel nut, but you won't read or hear many complaints about the ability of Savage rifles to produce tight groups. Or their price.

Over the past decade gun companies have battled to produce inexpensive rifles that offer four-figure accuracy, and Savage has been right in the middle of the fight. It was Savage who decided that budget rifles could have excellent triggers, and over a decade ago the company introduced the revolutionary AccuTrigger, which has a longer movement arm for a lighter pull, is user adjustable from 1.5 to six pounds and is extremely safe.

The AccuTrigger was a major step forward for economy rifles and for trigger design, and it was a shot across the bow to other rifle companies. Now there was no excuse for a budget rifle that wasn't accurate and didn't come with an excellent trigger. Best of all, Savage was putting those AccuTriggers in guns that didn't cost more than a few hundred dollars.

A few years ago, when every company seemed to be scrambling to introduce new price-point rifles, Savage was still enjoying the satisfaction of having gotten there first. The Savage 10/110 platform dates back to the 1950s, so the company already had established the low price/high performance tagline, and the AccuTrigger helped Savage solidify its reputation as one of the pre-eminent makers of accurate guns that the average shooter can afford.

But Savage wasn't done yet. The company introduced an even lower-priced entry gun called the Axis. It was all Savage—slightly quirky in design but inexpensive and accurate. But there was just one issue: Savage, the company that had always offered so much for so little, had proven stingy with its AccuTrigger. The Axis didn't get one. Sure, the price was really, really low, but hunters and shooters had been spoiled by a new generation of triggers. To some, the Sav-



age Axis felt like a step backwards. For others, buying a rifle that cost so little was worth the hassle of dealing with an outdated trigger.

Savage figured out a way to appease everyone by introducing the Axis II with an AccuTrigger. It cost a little more (just under \$100 more), but the trigger pull

was literally cut in half, and the creep and heavy pull were gone.

So we had this idea to test three of Savage's rifle/scope combos on the same day at the same range with the same ammo to see if we could draw any conclusions as to which represented the best value based on accuracy, as well as

to compare them based on aesthetics. The guns were the Axis XP, the Axis II XP and the 11/111 Trophy Hunter XP. And if you hadn't guessed, the XP tag means the gun ships with a scope.

All rifles were in .243 Win., an excellent choice for deer-size game for beginner and expert hunter alike. I shot three-shot groups with three different loads at 100 yards for all three rifles, which made it easy to rotate guns on and off the bench to be sure that the barrels had time to cool between groups. The loads were Hornady's American Whitetail 100-grain softpoint, Fusion's 95-grain coated bullet and Winchester's 58-grain Varmint X.

As I unloaded my arsenal on the bench, the guy who mows the range wheeled up behind me and asked how long I was planning on being there. Looking at the boxes and boxes of ammo, the trio of scoped rifles and the notepad and pen, he smiled and said, "I'll cut the shotgun range first."

### Savage Axis XP

The basic Savage Axis is...well...basic. My first impression was that it looked a little avant-garde, a little stylized. The stock is thin, with a finger groove on the fore-end and finger grooves on the narrow pistol grip that proved to be the perfect anchor point for shooting from a bench. The sliding two-position safety is located on the tang and is enormous, seemingly about the size of a quarter, and therefore easy to find and manipulate.

## AVAILABLE CHAMBERINGS

### Axis XP, Axis II XP:

.223, .22-250, .243, .25-06, .270 Win., 7mm-08, .30-06

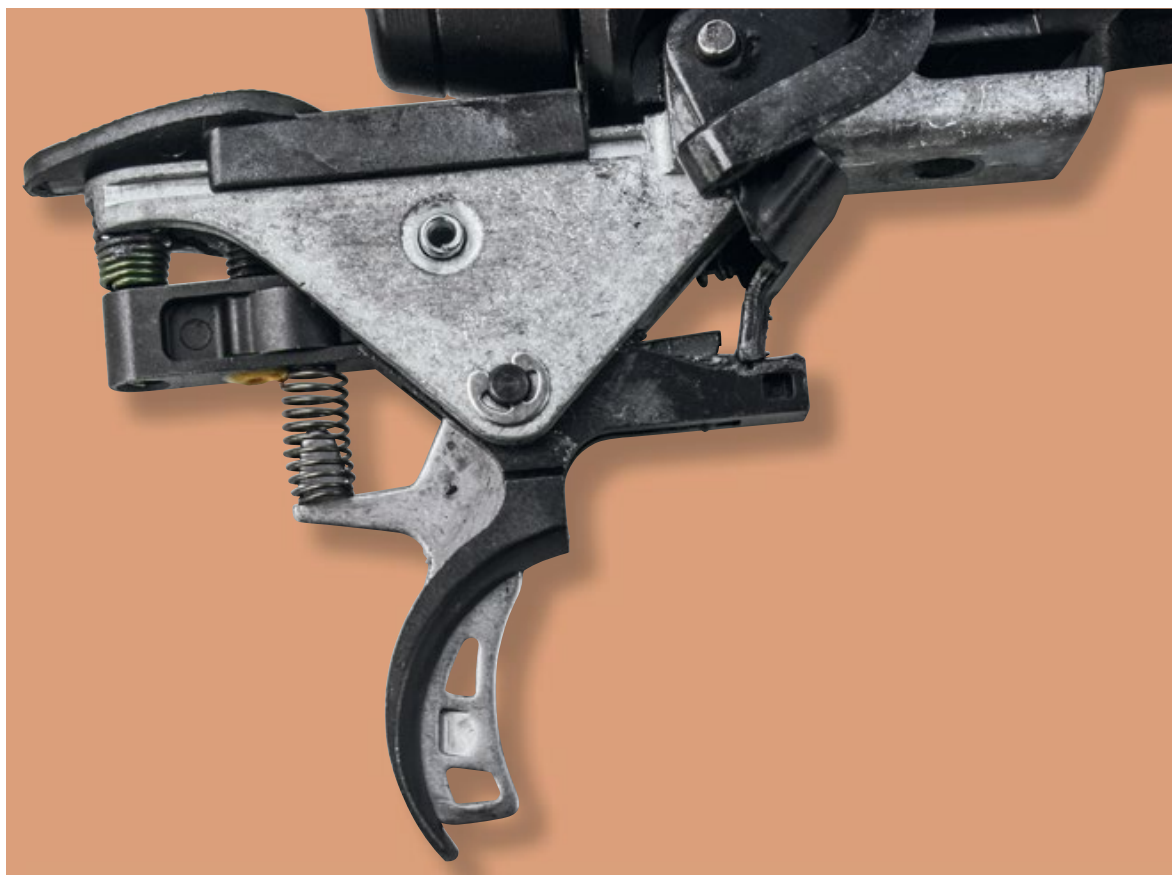
### 11/111 Trophy Hunter XP:

.204 Ruger, .223, .22-250, .243, .25-06, .260, 6.5 Creedmoor, 6.5-284 Norma\*, .270 Win., .270 WSM, 7mm-08, 7mm. Rem. Mag., .308, .30-06, .300 WSM, .300 Win. Mag., .338 Win. Mag.\*

*\*Not available in left-handed version*



There are definite variations in the grip circumference, angle and texture between the Axis rifles (l.) and the Trophy Hunter. The Axis grip plants the hand firmly in place, but the author found the Trophy Hunter's design more comfortable and natural.



The difference between the Axis and Axis II? The famous and oft-imitated AccuTrigger on the II adds a few bucks to the price, but the payoff will be worth it for most shooters.



The rear of the bolt face is enclosed, and a small cocking indicator button protrudes from the center. The large-diameter bolt has dual locking lugs and a floating bolt head with a plunger-type ejector. The cast bolt handle has cutouts designed to reduce weight, and I suppose the cutouts do save a couple ounces. The bolt handle itself is oblong and rather pill-shaped, but it's easy to grasp and manipulate.

It's a light gun at 6.5 pounds and sports a carbon steel 22-inch free-floated barrel and a one-piece receiver with a small ejection port for increased rigidity and better accuracy. The magazine was a detachable metal box, the same style used for every other rifle in this test, with an integral release lever at the front of the unit. The XP version comes with a 3-9x40 scope pre-mounted and bore-sighted.

I was prepared to dislike the trigger and, by extension, the rifle as a whole. But I couldn't. The Axis is a slick little bolt action that works well. The trigger isn't very good; it has some creep and breaks at a hefty 5.5 pounds. But overall accuracy was very good—results are shown in the accompanying chart—especially considering that this rifle and scope combo has a suggested retail of \$400. While all the averages were above an inch, I did have a few sub-m.o.a. clusters.

I had zero problems with feeding, extraction and ejection, and the gun actually did come out of the box bore-sighted, so with a few minor adjustments I was close to center. And while the variation between the accuracy figures generated by the Axis and Axis II aren't that disparate when fired from a fixed rest, I think the heavier trigger on the Axis would begin to show up more in the field. But if you've only got \$400 to spend on a rifle and scope, this is a fine gun.

### Axis II XP

The Axis II XP costs about \$90 more than the standard Axis XP. That extra money is buying you a better trigger—period. The AccuTrigger on the Axis II snaps cleanly at about 2.5 pounds, which makes a world of difference—not

so much in terms of overall accuracy (about a quarter-minute, based on my limited test), but in terms of feel. Range tests from fixed rests tell you what you need to know about overall accuracy potential, but they don't always measure field accuracy. And, again, I think the lighter trigger will serve you better in the field, when you may have to break a shot quickly or from an awkward position.

The trigger isn't the only difference

between the Axis and Axis II XP. The latter comes with a Weaver Kaska 3-9x40 scope with a standard crosshair and two stadia lines on the bottom post. I'd rate the Kaska as being a bit brighter than the Bushnell, but the two scopes are generally comparable. Both rifles have the same carbon steel barrel, the same stock design and the same aesthetics.

Accuracy was excellent, and given the Axis II XP combo's \$489 suggested retail, it's phenomenal. Like the Axis,

### SPECIFICATIONS

	AXIS XP	AXIS II XP	11 TROPHY HUNTER XP
CALIBERS	see accompanying sidebar		
CAPACITY	4+1	4+1	4+1
BARREL (in.)	22	22	22
OAL (in., as tested)	43.875	43.875	41.5
WEIGHT (lb.)	6.5	6.5	7.25
TRIGGER PULL (lb.)	5.5	2.5	2.5
SUPPLIED SCOPE (3-9X40)	Bushnell	Weaver Kaska	Nikon w/BDC
PRICE	\$400	\$489	\$612

### ACCURACY RESULTS

.243 WIN.	Bullet Weight (gr.)	Muzzle Velocity (fps)	Standard Deviation	Avg. Group (in.)
<b>AXIS XP</b>				
WINCHESTER VARMINT X	58	3,615	21.8	1.06
FUSION COATED	95	2,872	25.3	1.41
HORNADY AMERICAN WHITETAIL	100	2,815	22.5	1.23
OVERALL AVG.				1.23
<b>AXIS II XP</b>				
WINCHESTER VARMINT X	58	3,608	20.2	0.96
FUSION COATED	95	2,864	23.5	1.26
HORNADY AMERICAN WHITETAIL	100	2,821	22.9	1.01
OVERALL AVG.				1.08
<b>MODEL 11 TROPHY HUNTER XP</b>				
WINCHESTER VARMINT X	58	3,598	18.3	1.07
FUSION COATED	95	2,855	21.4	1.15
HORNADY AMERICAN WHITETAIL	100	2,833	24.3	1.02
OVERALL AVG.				1.08
NOTES: Accuracy results are averages of three three-shot groups at 100 yards from a fixed rest. Velocity figures are 10-shot averages recorded on a ProChrono digital chronograph placed 10 feet from the muzzle.				



the Axis II was bore-sighted and was actually on paper when I took it out of the box, which makes life a lot easier. As you can see from the chart, the Axis II XP package was a legitimate m.o.a. setup. If you are counting every dollar, the Axis is a fine rifle for the money, but if you can swing that extra \$89 bucks opt for the Axis II and the AccuTrigger.

### Model 11 Trophy Hunter XP

Like the other guns in this test, the 11 Trophy Hunter was chambered in .243

Win., but this rifle is available in 16 different chamberings from .204 Ruger all the way up to .338 Win. Mag., including some relative rarities like the .260 Rem. and the 6.5-284 Norma. (Standard-length action guns receive the Model 111 designation.) Unlike the Axis guns, the Trophy Hunter is available in left-handed models for many chamberings, and the XP version is treated to a Nikon 3-9x40 scope with BDC reticle—a pretty big step up from the other two. It, too, was bore-sighted, and this one required

only a half-dozen clicks before I was perfectly zeroed.

From the rounded bolt knob to the barrel nut, its profile is classic Savage. The 11 Trophy Hunter XP comes with the AccuTrigger and shares the same barrel length and composition as the other two, although the Trophy Hunter has a slightly better finish. Compared to the rather radical looking Axis, the Trophy Hunter has a more conservative look.

It's three-quarters of a pound heavier than the two Axis rifles, and the safety is a three-position model (but still located on the tang). The stock is wider and lacks the finger grooves found on the Axis and Axis II, and the Trophy Hunter's pistol grip has a more traditional checkering pattern than the Axis's clamshell design. In terms of accuracy, the Trophy Hunter was on par with the Axis II.

### Overall Impressions

If you are more impressed by rifles that produce tight little groups on the range than you are with high-grade walnut stocks, these guns deserve a look. All three shot well, and two of the three proved to be consistent m.o.a. performers while the Axis was close on their heels. The detachable box magazine on all three rifles fed smoothly, but every one required a little extra shove to latch them securely in place. All three performed reliably, and there were no problems with feeding, extraction, or ejection.

I appreciate the classic profile of the Model 11 Trophy Hunter XP, but the two cheaper rifles challenge the Trophy Hunter in terms of accuracy, and they're lighter. If I were buying one of these guns, I think I'd lean toward the Axis II simply because it has a better trigger than the standard Axis but is priced far enough below the Trophy Hunter that I could afford to buy several boxes of ammunition for the upcoming hunting season.

All three represent great values, and any one of them will serve a hunter well. Whether you prefer the stylized Axis or the more traditional Trophy Hunter, you're getting a lot of gun for your money. After all, these are Savage rifles. ■



The Trophy Hunter (r.) has a large, well-fitted recoil pad. The Axis guns have a smaller curved pad, and the fit is not as good as on the more expensive Trophy Hunter.



Savage is all about accuracy, and none of the three rifles disappointed on that score. The Axis didn't shoot quite as well as the other two, likely because the trigger's not as good.

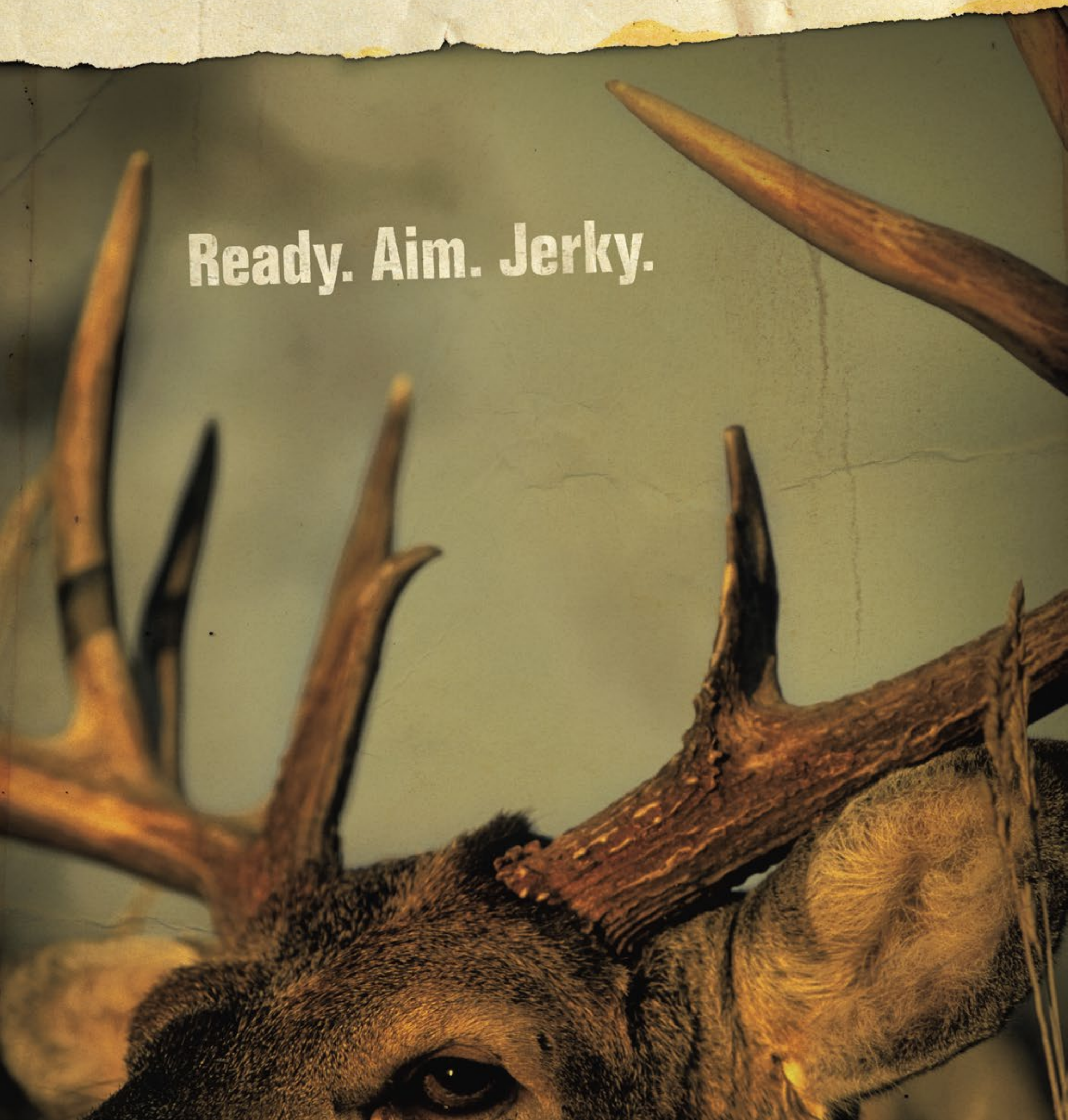


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# PLAYING 9 BALL

**STAG RUNS THE TABLE WITH THE  
MODEL 9, A FLAWLESSLY RELIABLE  
AR CHAMBERED FOR THE 9MM.**

by Patrick Sweeney





# 9MM

basic flattop upper receiver—a 7075-T6 forging, machined in-house at Stag and then hard-coat anodized to the proper mil-spec Type III standard. The Model 9 sports a carbine-length barrel with M4 handguards, a gas block with a 1913 rail on top and standard A2 pistol grip and M4 stock.

Basically, it looks like a Stag Model 3 but with M4 handguards. But then you note the prominent case deflector, short ejection port cover and lack of a forward assist. That's when you know you're looking at a whole different animal.

A 9mm bolt, lacking the forward assist ratchets, does not need a forward assist on its upper, so Stag left it off because that means fewer parts to install, fewer parts that could cause you problems and less bulk overall. But the dimensions of the rest of the exterior are absolutely standard, so you can install whatever sights, lights and other accessories that you want—as well as swap out any of the furniture you want to replace.

On the inside, it is like every other Stag AR ever made, which is to say it is well-built. The barrel is a 4140 steel tube, button-rifled to a twist of 1:10—which will stabilize even the 147-grain subsonic loads—and given a chrome-lined interior and a manganese phosphate exterior.

The receiver is a standard double push pin, small hammer-trigger pin lower, but with a difference. And that difference is just the start of where Stag

improved on the old. The original 9mm carbines used filler blocks to remake the magazine well of the AR lower—one proportioned for a magazine to hold .223/5.56 ammo—into one that secures a 9mm magazine in place.

Almost 30 years ago I had an AR 9mm carbine that was made to run with Sten magazines. They were about a dollar each back then, and it was a horrible way to do things. Mine ran fine, but I saw few others that did.

Colt decided to go with a modified Uzi magazine, but instead of doing the full engineering workup to make it run right, designers modified the magazines to ease the task of designing and building the carbine. The filler blocks were cross-drilled and pinned into the lower receiver, and depending on how diligent the driller was, they were in the right place, more or less.

Combine maybe-correct blocks with sometimes dodgy magazines, and the Colt would either run just fine or be a real pain in the neck. Further, if you dropped a loaded magazine, half or more of the rounds would squirt out on impact. I've had Colt magazines partially self-unload just while I was holding them.

What did Stag do? Well, first, it altered the magazine well of the lower, broaching it specifically for a 9mm magazine—a simple step if you are a dedicated designer and manufacturer. The magazine well won't hold anything else, and it is solid aluminum—no

**O**ne of the last daring designs to come out of Colt turned the gas-operated .223 Stoner carbine, what we call the AR-15, into a blowback 9mm carbine. Man, that gun—and other makes attempting the same design—was fun. But it was a mass of compromises. Today, Stag has taken the touchy 9mm carbine and turned it into a wonder.

The Stag Model 9 is a 9mm carbine that looks a lot like the old Colt carbine but has none of the faults or shortcomings of the earlier carbine's compromises. At first glance it simply appears to be a standard AR-15 type rifle. It has the



block-filling gaps. Then, Stag fixed a feed ramp into place on the lower to guide the rounds out of the magazine and into the chamber.

At the rear of the magazine well is a fixed-blade ejector to toss the empties overboard. And last but not least, engineers went with newly designed magazines from ASC. Not only are they of new design, but also they're made of stainless steel and lock the Model 9 open when they are empty.

Of course, the lower isn't of much use unless the upper is working with the rest of the team, so Stag built a tank-tough upper. The bolt on a 9mm AR is different from a 5.56 because as

a blowback design there's no need for a rotating bolt, so the carrier is simply machined as the bolt.

Think of a regular carrier, but when it comes time for the factory to bore out the bolt tunnel, the folks at the factory simply machine a breechface for a 9mm case head. The extractor is held in the carrier, and the firing pin works just like the one on a 5.56 carbine except there is a firing pin rebound spring inside of the bolt.

The 9mm bolt/carrier has a key on it, not unlike that of the 5.56, but it has nothing to do with gas. It is simply there to keep the carrier properly oriented inside of the upper. Without it, the bolt

could rotate inside the receiver, and that would be bad.

Since the chamber is just that, the chamber, and there is no room or need for locking lugs and such, a 16-inch barrel on a 9mm carbine appears to be a bit shorter than a 16-inch barrel on a 5.56.

The Stag's buffer tube has the normal spring and buffer weight, and the lower has a normal hammer, trigger and disconnect. The Colt had a special buffer weight—one made as heavy as possible—and the hammer had a special design. If you tried to swap out the 9mm-specific Colt hammer for a normal one, you often ran into reliability problems.

On the Stag, if you want to install a match trigger, you can select from any one of the seemingly hundreds available, as they will all fit. And if you want to fine-tune it for felt recoil, you can swap buffer weights of differing masses to your heart's desire.

Loading is simple since the magazines are double-stack and double-feed. They load easily enough, although you will encounter increased resistance as you get more into the tube. Recoil with a 9mm carbine is an interesting experience. Yes, it is "only" a 9mm, but you don't have any of the recoil reduction of



The big tip-off that the Model 9 isn't your everyday AR is the short ejection port cover and larger than usual case deflector.



One of the problems that plagued earlier 9mm ARs was the mag well. Rather than block a standard well, Stag designed a new one—which contributes greatly to reliability.

## SPECIFICATIONS

### STAG MODEL 9

TYPE	blowback-operated AR-15
CALIBER	9mm Luger
CAPACITY	32+1 (where legal)
BARREL	16 in., chrome-lined, 1:10 twist, phosphate finish
OVERALL LENGTH	32.5–35.75 in.
WEIGHT	6 lb., 10 oz.
RECEIVER	anodized 7075-T6 aluminum, phosphate steel
FURNITURE	A2 pistol grip, M4 stock, M4 fore-end (as tested) or Diamondhead VRS-T fore-end
SIGHTS	none; integral optics rail
TRIGGER	single stage; 6 lb., 8 oz. pull (as measured)
PRICE	\$990
MANUFACTURER	Stag Arms, STAGARMS.COM



a gas system to help you. So with some loads and some buffer weights, recoil can be more than a bit bouncy. But if you settle on a particular load, you can tune the Stag to be soft in recoil.

Noise is a different and much more pleasant experience. Where a .223/5.56 carbine can be obnoxiously loud, a 9mm out of a 16-inch barrel can be downright quiet. If you use a normal charge of fast-burning pistol powder, you have a very low pressure at the bullet's uncorking. If you load heavy bullets, you can even get rid of the supersonic crack.

And for those who have such wondrous devices, a suppressor can then take the rest of the drama out of shooting a 9mm carbine. Indeed, you can make the entire affair so quiet that the loudest noise going on is the bolt clacking back and forth.

Accuracy is simply brilliant. My Stag shot everything well, but some particular loads were amazingly accurate. Hundred-yard steel plates? No problem. Clay pigeons lying on the hillside? Piece of cake. For the run-and-gun drills and just fun shooting, I tried both an EOTech and a TruGlo on the flattop receiver and blasted away until I was grinning. For accuracy work, it was a simple matter to take a Weaver 1-5X scope with a Weaver QD mount and install it on the Stag Model 9.

Okay, so this is fun to shoot. But what else? What advantages does the Stag Model 9 offer over, say, a 5.56 Stag carbine? First is cost. Ammo prices are coming down, but 9mm is still cheaper than 5.56. And if you reload, you can drop prices even more. Last I checked, you can reload 9mm for less than half the cost of new .223/5.56 ammo, and when it comes to reloading, 9mm is a significantly less difficult caliber to reload than .223.

Next up is range utility. There are ranges, mostly indoor, that are not happy about rifles. If you can shoot a handgun there, you can shoot a Stag 9 there—and at closer distances than a .223 rifle would be allowed, too.

For home defense, a 9mm carbine offers a lot. The softer recoil, lower noise and ease of handling of ARs in general

put a Stag Model 9 on the first page of choices. Next, it will work with all the usual high-tech hollowpoint defensive loads, and you'll get increased velocity as well—depending on the powder used in a particular load. With faster-burning powder, you'll see minimal velocity increase when you go from, say, a four-inch pistol to a 16-inch carbine, but with slower-burning powder, you can gain as much as 200 fps.

When my gun club began 3 Gun competition, we shot 9mm carbines as well as other rifles. Then we began using them in our regular IPSC handgun matches. What we found was that a C-class shooter firing a 9mm carbine could give an A-class shooter with a handgun a hard time. If the carbine shooter put a red-dot sight on his 9mm, he could beat the times and scores of anyone in the match, even the club

champion. That's how much of a speed and accuracy advantage a 9mm carbine has over a 9mm handgun.

Someone is sure to complain that by making the lower 9mm-specific, Stag has made it impossible to rebuild the Model 9 to a 5.56. Why would anyone want to? Given the current price range and availability of AR-15 rifles, just buy a whole .223/5.56 rifle instead of the parts and hassle to rebuild the Model 9.

The Model 9 can also be had with the clever and handy Diamondhead VRS-T free-float handguard. And because it's a Stag, it's also available in a left-hand version. The Model 9 is fun to shoot, economical, accurate, fast and able to accept all the normal accessories—and unlike past Stoner 9mm carbines it's totally reliable and not the least bit fussy. What are you waiting for? ■



The Model 9 bolt (l.) doesn't have a separate bolt inside a carrier as standard AR-15s do (r.). Instead, it's one piece, with a carrier key installed to maintain proper position inside the receiver.



The double-stack magazine pushes rounds onto feed ramps in the lower receiver, and feeding on the author's sample was flawless.

## ACCURACY RESULTS

### STAG MODEL 9

9MM LUGER	Bullet Weight (gr.)	Muzzle Velocity (fps)	Standard Deviation	Avg. Group (in.)
CCI/SPEER TMJ	115	1,496	7.5	2.00
HPR JHP	115	1,289	36.4	2.00
ARMSCOR FMJ	124	1,265	33.0	2.25
BLACK HILLS JHP	124	1,411	16.0	1.75
FEDERAL HST	124	1,414	5.6	1.50
HORNADY XTP	124	1,313	16.3	1.25
NOSLER JHP	124	1,357	6.4	1.50
HORNADY CRITICAL DUTY	135	1,440	11.7	1.50

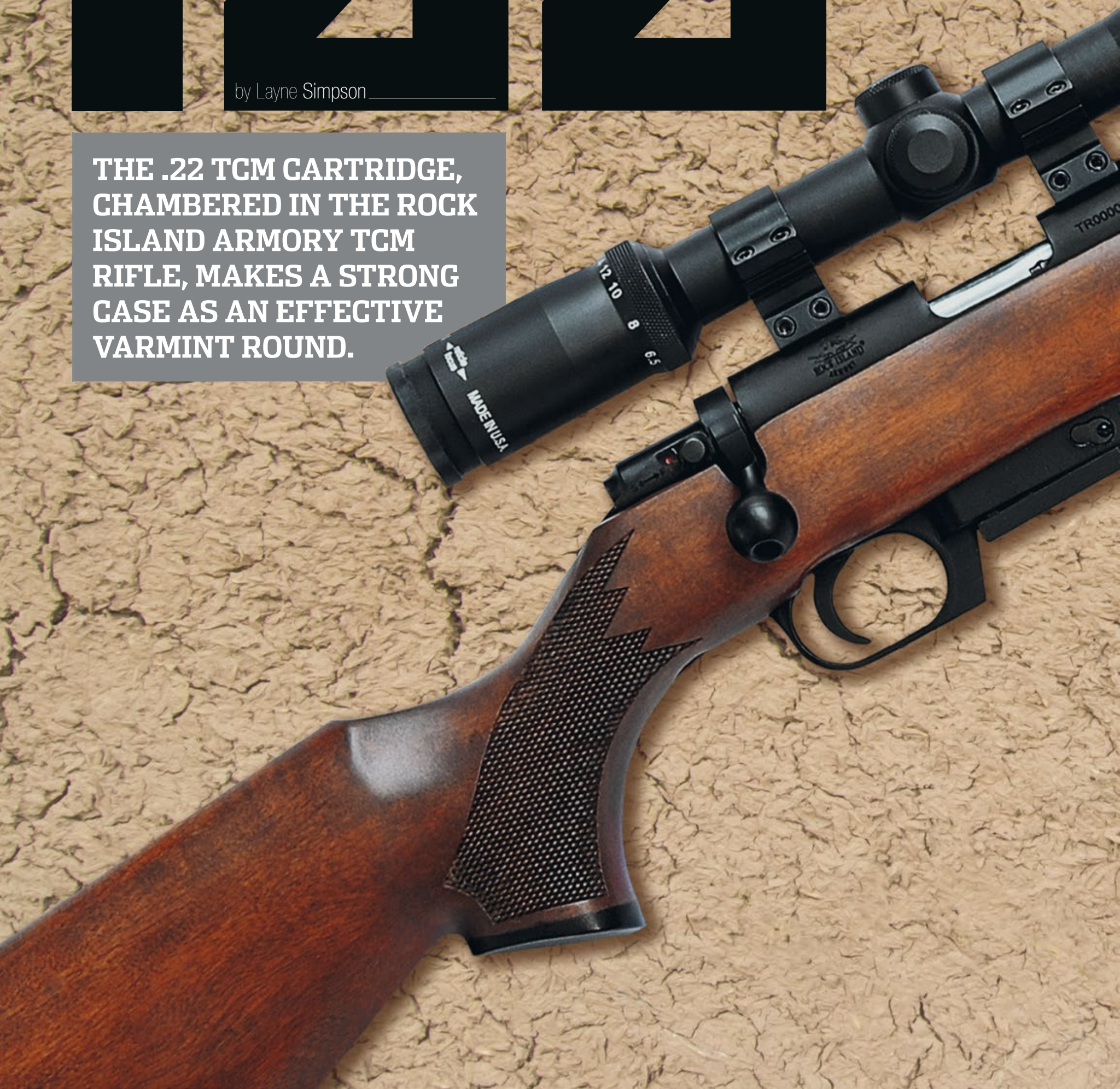
**NOTES:** Accuracy results are averages of four five-shot groups at 50 yards off a Sinclair front rest and rear bag using Weaver 1-5X scope set at 5X. Velocities are averages of 10 shots measured on a PACT MKIV chronograph set 15 feet from the muzzle. Abbreviations: FMJ, full metal jacket; JHP, jacketed hollowpoint; TMJ, total metal jacket



# A NEW 22

by Layne Simpson \_\_\_\_\_

**THE .22 TCM CARTRIDGE,  
CHAMBERED IN THE ROCK  
ISLAND ARMORY TCM  
RIFLE, MAKES A STRONG  
CASE AS AN EFFECTIVE  
VARMINT ROUND.**







**A** few years back, Fred Craig of Pahrump, Nevada, developed a cartridge called the .22 Micromag. When it was adopted later by Armscor, the name was changed to .22 TCM—an acronym for Tuason (for Martin Tuason, Armscor president), Craig, Micromag. It is the latest of several factory-loaded .22 caliber center-fire cartridges originally developed for handguns.

Remington got the bandwagon rolling back in 1961 by necking down the .357 Magnum for .222-inch bullets and calling the result the .22 Jet. It was introduced in the ill-fated S&W Model 53 revolver. Two years later, Remington struck again with the .221 Fireball, a cartridge on the shortened .222 Rem. case designed for the equally new XP-100 pistol. Around about the same time, the Russians came up with the 5.45x18 Soviet for the compact PSM autoloading pistol. And, of course, we

have the 5.8x28 FN in the FN Five-Seven autoloader.

Then in 2012 came the .22 TCM in a wide-body 1911 pistol from Rock Island Armory. The capacity of its double-stack magazine is 17 rounds. Also included with the gun is a barrel and recoil spring for converting it to 9mm Luger. The magazine works with both cartridges.

The .22 TCM is the fifth factory-loaded .22 caliber offspring of the 1950-vintage .222 Rem. The others are the .222 Rem. Mag., .223 Rem., .221 Fireball and the European-designed 5.6x50 Mag. The new cartridge is also the shortest. That title did belong to the .221 Fireball, but its 1.400-inch case makes the 1.022-inch case of the .22 TCM the Mickey Rooney of the .222 Rem. family of cartridges.

Maximum overall cartridge length is 1.275 inches, same as for the .45 ACP. Loaded with a Small Pistol primer and a 40-grain jacketed hollowpoint bullet, the velocity rating from a five-inch barrel is 1,875 fps. That's no brag as some

lots of ammunition have exceeded 1,900 fps. Economical to shoot as factory ammo goes, I have seen it advertised by Cheaper Than Dirt and other companies at less than \$20 for a box of 50.

The .22 TCM chambering is now available in a Rock Island Armory rifle called the Model TCM. Advertised velocity of the Armscor ammunition from its 22-inch barrel is 2,800 fps. The politically correct among us love to bounce around the term "value priced" when describing an inexpensive firearm, but where I come from a rifle like the Model TCM still goes by the name of "knock-about." And I don't mean to be derogatory because some of the best buys in the rifles of yesteryear have worn that moniker.

The Model TCM has a turnbolt action that, according to an Armscor official, was originally designed for the Armscor Model 1500 rifle in .22 WMR. Changing the firing pin to centerfire along with making the receiver, bolt



and barrel of stronger steel (Type 4140) as well as more stringent inspection processes resulted in a rifle capable of handling the .22 TCM cartridge. The action was also modified to accept the double-stack magazine of the pistol.

The design of the bolt is not identical

to the bolt of the Anschütz 1730/1740 action, which is used for rifles in .22 Hornet and .222 Rem., but they are similar. The bolts of both rifles consist of a non-rotating front section containing the extractor, along with a rotating rear section containing a single locking lug.

When the bolt is rotated to its locked position, the lug engages a shoulder in the floor of the receiver. But their breech-locking designs are taken one step further. In both actions, the root of the bolt handle bears on the rear edge of its cutout in the receiver tang and in doing so considerably increases resistance against cartridge back-thrust during firing. The Anschütz was also originally intended for the .22 LR and later modified to handle centerfire cartridges.

When the firing pin of the Model TCM is in the cocked position, its rear end protrudes in easy view from the rear of the bolt shroud. There can be some bolt travel binding, but a light film of oil spread over its surface every 100 rounds or so keeps it running smoothly. Bolt lift is made easy by an occasional dab of grease on the firing pin cocking ramp of the cocking piece. The rear surfaces of the locking lug and the bolt handle where it bears on the receiver should also be kept lubricated.

Since the action is designed for an extremely short cartridge, bolt throw is only a hair over 1.75 inches. And while the spring-loaded extractor at the face of the bolt seems quite delicate for a centerfire rifle, yanking hundreds of spent cases from a powder-fouled chamber presented no problem for



Magazine options include a supplied five-rounder and also the 17-round mag Rock Island Armory uses in its TCM-chambered 1911. Simpson found the five-rounder hard to load and would opt for the larger-capacity mag downloaded to 10.



Cartridges (l.-r.): .22 TCM, .22 Hornet, 5.7x28 FN, .221 Rem. Fireball, .22 Rem. Jet. Case capacity of the .22 TCM is close to the Hornet's and about 11 percent greater than the FN. Among the author's bullet choices for handloading were the Hornady 35-grain V-Max (far l.) and the Sierra 40-grain Hornet, shown alongside the factory 22-grain softpoint.

## SPECIFICATIONS

### ROCK ISLAND ARMORY MODEL TCM

TYPE	bolt-action repeater
CALIBER	.22 TCM
CAPACITY	5+1
BARREL	22 in., 6 grooves, 1:16 RH twist
OVERALL LENGTH	40 in.
WEIGHT	7 lb.
FINISH	black Parkerizing
STOCK	stained hardwood
TRIGGER	single-stage; 5 lb., 8 oz. pull (measured)
SAFETY	two-position
PRICE	\$435
IMPORTER	Armscor USA/Rock Island Armory, US.ARMSCOR.COM



it. Even so, should a case stick due to excessively high chamber pressures, you would not want to pound on the bolt handle. A fixed-blade ejector rests on the floor of the receiver bridge. The bolt release located on the left-hand side of the receiver bridge works nicely and is within easy reach of a thumb.

A two-position, trigger-locking safety lever located at the right-hand side of the receiver tang operates smoothly, but there are no spring-loaded ball detents to prevent it from being inadvertently shifted from the Safe and Fire positions. At 5.5 pounds, trigger pull is a bit heavy for a varmint rifle, but otherwise the quality is darned good for a rifle in its price range. No creep that I could detect, and while there was some over-travel, the break was crisp.

The magazine holds five rounds, but for those who prefer to drop 17 varmints between reloads, as I mentioned the double-stack magazine from the Rock Island Armory pistol works in the rifle. The five-round magazine is not easy to load, especially the last round. If the rifle were mine and I intended to shoot it a lot, I would use the 17-round magazine as a 10-rounder because it is so much easier to load.

The receiver is grooved for scope mounting, but due to its rounded top, you can't just grab any rings and expect them to work. I first tried Talley and found them to be a no-go. When a friend at Armscor sent a pair of Sun Optics rings designed to fit dovetails ranging from 9.5 to 13mm, I was in business. A 3-9X scope from the same company also arrived, but I desired more magnification and opted for a Burris 6.5-20X Fullfield II instead. A screw in the top of the receiver at the forward end of its grooved section serves as a stop for the front scope ring.

The medium-heavy, button-rifled barrel is 22 inches long, measures 0.750 inch at the muzzle and has a rifling twist rate of 1:16. That twist has been standard for the .22 Hornet from the day it was introduced during the 1930s. It usually won't stabilize anything much longer than the 45-grain Hornet bullets available from Sierra, Hornady and Speer, which is just fine since heavier



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bullets cannot be pushed fast enough for the explosive expansion needed on varmints such as prairie dogs and flickertails. The barrel is threaded and screwed into the receiver.

The stock appears to be stained birch. Other features include adequate checkering coverage and a fore-end properly shaped for shooting over a sandbag. Increasing the price just enough to include sling swivels would not be a bad idea. The stock is removed from the barreled action by turning out the usual hex-head bolts at tang and receiver, but since the magazine catch button interferes with stock removal, it too has to be removed. Most who own 1911 pistols will find this easy to do.

The lack of pressure-tested load data for the .22 TCM has not deterred hand-

loaders. Because case capacity is close to that of the .22 Hornet, starting loads listed in various reloading manuals are commonly used. Gross water capacity of the Armscor cases on my loading bench is 0.5 grain more than for the .22 Hornet

(AMMOSUPPLYWAREHOUSE.COM). Also available are Armscor unprimed cases for \$19 per 100 or \$184 per 1,000. Reloading dies are in the works at Redding.

Craig recommended the use of W296 and H110 propellants in his cartridge.

## CRAIG RECOMMENDED THE USE OF W296 AND H110 IN HIS CARTRIDGE.

(Winchester brass) and 1.3 grains more than for the 5.7x28 FN case.

For a while, Fred Craig sold unprimed cases and custom-made dies. Hornady is now making the reloading dies, but at this time they are available only through Ammo Supply Warehouse

Other .22 Hornet powders, such as Hodgdon Lil'Gun, Ramshot Enforcer, Accurate 1680 and Alliant Power Pro 300-MP, may eventually prove to be equally good candidates. The Western Powders website will likely be the first source for load data, but I am told it is still months away.

Armscor sent plenty of ammo, so I began testing the rifle's accuracy by shooting 10 five-shot groups at 100 yards. Group sizes ranged from 2.28 to 4.30 inches for an overall average of 3.08 inches. Case extraction was a bit sticky, and that interfered with ejection—with some cases having to be manually plucked from the ejection port. There were also three misfires.

Figuring the rifle was capable of better accuracy, I turned to handloading. For load development I used the Federal 205M Small Rifle primer and three bullets: Speer 33-grain Hornet TNT HP, Hornady 35-grain V-Max and the Sierra 40-grain Hornet.

As I discovered, the Hornady and Sierra bullets are not suitable if the rifle is to be used as a repeater. In order for cartridges to fit into the magazine, overall length has to be held close to the 1.250 inches of Armscor factory ammunition. The ogive of the Armscor bullet is quite short, and that results in a short length. It measures 0.470 inch compared to 0.485 and 0.515 inch respectively for the Sierra and Hornady bullets.

Seating the Sierra and Hornady bullets to the same overall cartridge length as Armscor factory ammo positions the mouth of the case far out on their ogives, reducing surface area contact between their full-diameter shanks and the neck of the case to less than 100



Handloaders can currently find dies from Hornady and unprimed cases from Armscor, but right now they're available only from Ammo Supply Warehouse.

### ACCURACY RESULTS

#### ROCK ISLAND ARMORY MODEL TCM

.22 TCM	Bullet Weight (gr.)	Muzzle Velocity (fps)	Standard Deviation	Avg. Group (in.)
ARMSCOR SP	40	2,777	35	3.08
SPEER HORNET TNT HP*	33	2,932	19	5.19
HORNADY V-MAX*	35	2,915	38	2.16
SIERRA HORNET*	40	2,664	17	1.98

**NOTES:** (\*Handload; see text.) Accuracy results are averages of 10 five-shot groups at 100 yards from a benchrest. Velocities are averages of 10 rounds measured 12 feet from the muzzle with an Oehler Model 33 chronograph. Abbreviations: HP, hollowpoint; SP, softpoint



## A NEW .22

percent. The chamber throat in the rifle was long enough to allow bullets to be seated out farther than factory length and still remain shy of contact with the rifling. That enabled me to seat the Sierra and Hornady bullets to respective overall cartridge lengths of 1.350 and 1.375 inches. Doing so required shooting the ammo single shot, but when bumping off prairie dogs with a bolt-action rifle, I seldom use its magazine anyhow.

Measuring only 0.405 inch long, the 33-grain Speer bullet is shorter than the Armscor 40-grain bullet and can be loaded to an overall cartridge length that's compatible with the magazine of the rifle.

Hodgdon's Annual Manual lists starting charges of W296 in the .22 Hornet as 11.0 grains for the Hornady 35-grain V-Max and 10.0 grains with the 40-grain Speer for respective velocities of 2,805 and 2,569 fps. Also listed are velocities of 3,060 and 2,795 fps for maximum charges of that propellant. Having no Speer bullets of that weight on hand, I started with 9.8 grains behind the 40-grain Sierra and 11.0 grains with the 35-grain Hornady. Respective velocities with those starting loads in the Rock Island Armory rifle were 2,479 and 2,774 fps.

Increasing the charges behind the two bullets in 0.2-grain increments, I stopped adding powder behind the 40-grain bullet once its velocity closely matched that of the Armscor factory load. According to Hodgdon, when 35- and 40-grain bullets are loaded to the same chamber pressure in the .22 Hornet, the lighter bullet is 265 fps faster. I stopped increasing the charge of W296 behind the 33-grain Speer and 35-grain Hornady bullets when their speeds exceeded the velocity of the 40-grain Sierra by about 250 to 260 fps.

Just as had happened with Armscor factory ammo, case extraction was a bit sticky with those loads. Reducing pow-

**WARNING:** The loads shown here are safe only in the guns for which they were developed. Neither the author nor InterMedia Outdoors assumes any liability for accidents or injury resulting from the use or misuse of this data. Shooting reloads may void any warranty on your firearm.

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der charges for a reduction in velocity of 75 to 100 fps transformed the Model TCM into a different rifle. Case extraction and ejection became silky smooth, and accuracy with the Hornady and Sierra bullets improved dramatically.

While firing close to 300 rounds of handloaded ammunition, I experienced seven misfires with the Federal 205 Small Rifle primer. Since the .22 TCM was originally developed for 1911 pistols, it used a Small Pistol primer, and I assume that's what Armscor factory ammo has.

Thinking a switch to a Small Pistol primer would eliminate the misfires, I tried the CCI 500 and received poor results. Misfires actually increased, velocity spread just about doubled, accuracy got worse and cases emerged from the chamber with their exteriors heavily coated with powder fouling. Other Small Pistol primers might work better, and the CCI 500 might work better with other powders, but it is not the primer to use with W296 in the .22 TCM. I'll stick with the Federal 205M until

something better comes along.

The Rock Island Armory Model TCM had a two-digit serial number, and I have been in this business long enough to know that early production firearms made by any company can and occasionally do escape the factory with a gremlin or two lurking inside. Company

will now apply to the rifle. But due to the litigious society we live in, I have included in this report only the starting loads used with various bullets. That's all that will be needed by experienced handloaders who own chronographs and know what sticky case extraction means. The inexperienced would be

## THE INEXPERIENCED WOULD BE WISE TO STICK WITH FACTORY LOADS.

officials have been made aware of the misfire problem, and I'm sure the issue has been resolved in rifles built after the one I shot.

The number of Lee and Hornady reloading dies and Armscor unprimed cases sold since the introduction of the .22 TCM in 2012 indicate many who own Rock Island Armory 1911 pistols chambered for the cartridge are handloading it successfully. The same

wise to stick with factory loads until pressure-tested data becomes available.

The very first varmint rifle I shot as a youngster was a Savage 219 in .22 Hornet. I have long had a fondness for the cartridge and presently own five rifles chambered for it. But I will have to admit, a stronger case makes the .22 TCM an even better varmint cartridge. What we have here is the modern version of an old favorite. ■



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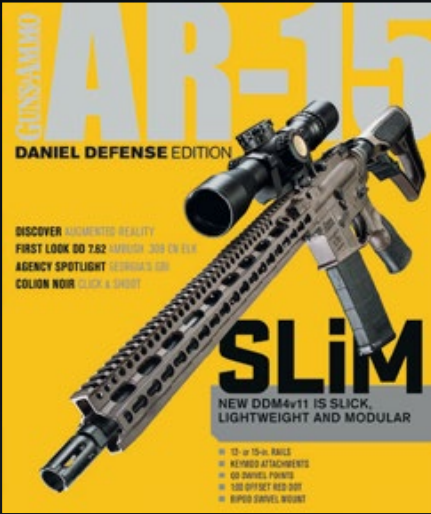
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# T for FANTASTIC

by Joseph von Benedikt

**F-CLASS SHOOTING IS A TERRIFIC—AND FUN—WAY TO TEST YOUR LONG-RANGE SKILLS.**





**I**f you like playing the precision long-range game—setting up super-accurate rifle/ammo combinations, calculating extreme ballistics and doping wind—F-Class is a shooting sport worthy of your attention. I like all those things, but I had never taken the opportunity to shoot it. So when I got an opportunity to write about it, I jumped at the chance.

Sometimes called “belly benchrest,” F-Class was originally conceived as a shooting sport wherein competitors of nearly any physical ability can compete on an equal footing. Because it’s all fired from prone, you don’t need to get into positions such as sitting that can be difficult for some people. And because you use a front rest, it avoids the physical demands of being in a tight sling for

long periods of time, as you are in classic NRA High Power.

F-Class consists of two categories: F-Open and F-T/R. In F-Open—the most popular division—rifles must weigh under 10 kilograms (roughly 22 pounds), may be any caliber .35 and under and may be fired from an adjustable front rest (such as benchrest shooters use) plus a rear sandbag. Rifles must be fired from the shoulder, and rail guns are not allowed.

In the F-T/R division, caliber options are limited to standard .223 Rem. or .308 Win. Rifle weight limit is 8.25 kilograms (about 18 pounds). The only front support allowed is a bipod; a sandbag may be used under the rear of the stock.

It became apparent early on that standard Palma-type 1,000-yard targets

were too easy for good F-Open shooters, so the targets were shrunk for F-Open division. Instead of having a 20-inch 10-ring and 10-inch X-ring, they’re halved in size. Yep, the 10-ring is 10 inches, fractionally less than one m.o.a., and the X-ring is a saucer-size five inches in diameter. Still, on windless days a very good shooter will shoot mostly 10s. F-T/R shooters still fire at the bigger traditional target.

Commonly, the course of fire consists of 60 rounds at 1,000 yards for record in three separate 20-round strings. Unlimited sighting shots and 30 minutes are allowed for the first string; just let your scorer know when you’re ready to go for record. Generally, only two sighting shots are allowed prior to firing for record during the 22-minute second





and third strings. Depending on the match, competitors may shoot a string at 800, 900 and 1,000 yards instead of all three at 1,000. It pays to obtain a copy of the match program ahead of time and find out what the range and round counts will be so you can chart dial-ups and pack enough ammo.

Getting started in F-Class is easy, provided you've got an accurate rifle wearing a quality scope with enough magnification. Any good varmint rifle, tactical rifle or heavy big game hunting rifle with a rifling twist fast enough to stabilize long, aerodynamic bullets is sufficient—as long as it's very accurate.

How accurate? Theoretically, in perfect conditions a one m.o.a. rifle would work because it can place all of its shots in the 10-inch Open division 10-ring. However, under real-world conditions and fired from the shoulder of an imperfect human being, a one m.o.a. rifle will spread most of its shots well into the nine and eight rings.

So sooner or later you'll want to purchase or build a specialized rifle. Most serious competitors demand 0.5 m.o.a. accuracy out of their match rifles, and 0.25 m.o.a. capability isn't an unrealistic goal. Savage was kind enough to loan me a Model 12 F-Class in 6.5-284 Norma caliber (\$1,600, SAVAGEARMS.COM). It's a bona fide sub 0.5 m.o.a. rifle

with the right ammunition—and when I do my part.

For an optic, you'll need a clear rifle-scope that offers high magnification—at least 20X on the top end—and, most importantly, reliably consistent adjustment turrets. You need to be able to dial up to 1,000 yards and back to perfect zero time after cog-wearing time. And

COM), which offers windage hash marks on the horizontal crosshair. Unlike distance, which is consistent and can be predictably compensated for, wind is fickle. Doping it correctly takes experience and a healthy dose of luck. Holding off the center—using hash marks on the crosswire for consistency—enables flexibility. If you see the mirage running

## IT'S ESSENTIAL TO HAVE YOUR SCOPE MOUNTED PERFECTLY LEVEL AND TO HAVE A TRUE NO-WIND ZERO.

depending on the matches you shoot, it will have to run up and down between 800, 900 and 1,000 yards and be spot on each time.

Plus, you'll need a scope with enough elevation adjustment to get you to 1,000 yards. In most calibers, that ranges from about 22 m.o.a. to 35 m.o.a. Unless your scope has a great deal of adjustment, you may need a base with built-in m.o.a. I'm a fan of Nightforce's offerings, but there are many good ones out there.

For my first go-round with F-Class, I used one of Burris's new Veracity riflescopes in 4-20x50 with the E1 FFP Varmint reticle (\$799, BURRISOPTICS.

a bit faster as you squeeze the trigger, you can hedge a bit, allowing a little more hold with your reticle.

It's essential to have your scope mounted perfectly level and to have a true no-wind zero. Compensating for wind is tough enough without battling scope-induced errors. Speaking of drift, you'll need to incorporate spin drift into your holds. Most rifles with a right-hand rifling twist will have seven to 12 inches of spin drift to the right at 1,000 yards.

If you decide to get serious about F-Class, caliber choice is critical to being competitive in the Open division. You want something that pushes a bullet fairly fast yet isn't too hard on barrels.



F-Class Open equipment includes gun and scope—in this case a Savage Model 12 F-Class 6.5-284 and Burris Veracity 4-12x50—adjustable front rest (a Sinclair here) and rear bag. In F-T/R, a division for .223 and .308 rifles, you'll use a bipod instead of an adjustable rest.



You'll shoot 65 to 80 rounds per match in long strings that heat barrels. Plus, you'll want something that recoils lightly enough that you can stand to shoot 80 rounds from prone in a morning's worth of shooting. Since most F-Class matches prohibit muzzle brakes, heavy long-range performers such as the .338 Lapua are poor choices. Better are the light-recoiling, economical 6.5 Creedmoor, 6.5-284 Norma and 6.5x47 Lapua.

When choosing a bullet for F-Open, find something that is both accurate in your rifle and aerodynamic. Typically, that means a match bullet with a high ballistic coefficient. Low BC bullets shed velocity much faster than sleeker designs, resulting in exponentially greater wind drift.

To illustrate that, let's take a quick look at a dramatic example. The 142-grain 6.5mm Sierra MatchKing bullet I used has a reasonably high BC of 0.580 (averaged). Compare that to a typical 180-grain flat-based .30 caliber hunting bullet such as Remington's Core-Lokt, which has a much lower BC of 0.402. Fired at 2,900 fps, at 1,000 yards the MatchKing maintains 1,510 fps and drifts 70.4 inches in a 10-mph 90-degree crosswind. The Core-Lokt maintains only 1,171 fps and drifts 112.2 inches. The forgiveness that the more aerodynamic bullet offers makes a tremendous difference when battling a stiff, inconsistent wind.

Other equipment necessary to F-Class happiness is either a good bipod or a benchrest-quality front rifle rest, depending on whether you shoot in F-T/R or F-Open division. You also need a rear bunny-ear type sandbag and a shooting mat. The best front rest I've used is a Sinclair. I've got an old bench model and a new Heavy Varmint version, and I love both.

When your relay is called to the line, set up front and rear rests, ammo and your rifle with a chamber flag in place. Consult your ballistic card or calculator and dial up for whatever distance you're about to shoot.

Watch the range flags closely to get a feel for what the wind is doing. And while you don't really need a spotting scope to see the target spotter disc

(more on that in a second), some shooters like a spotting scope for reading mirage.

The range officer will call a three-minute prep period, allowing you to remove the chamber flag and get behind the rifle and adjust your rests and dry-fire if desired. Confirm the elevation adjustment setting on your turret. Continue monitoring the wind flags.

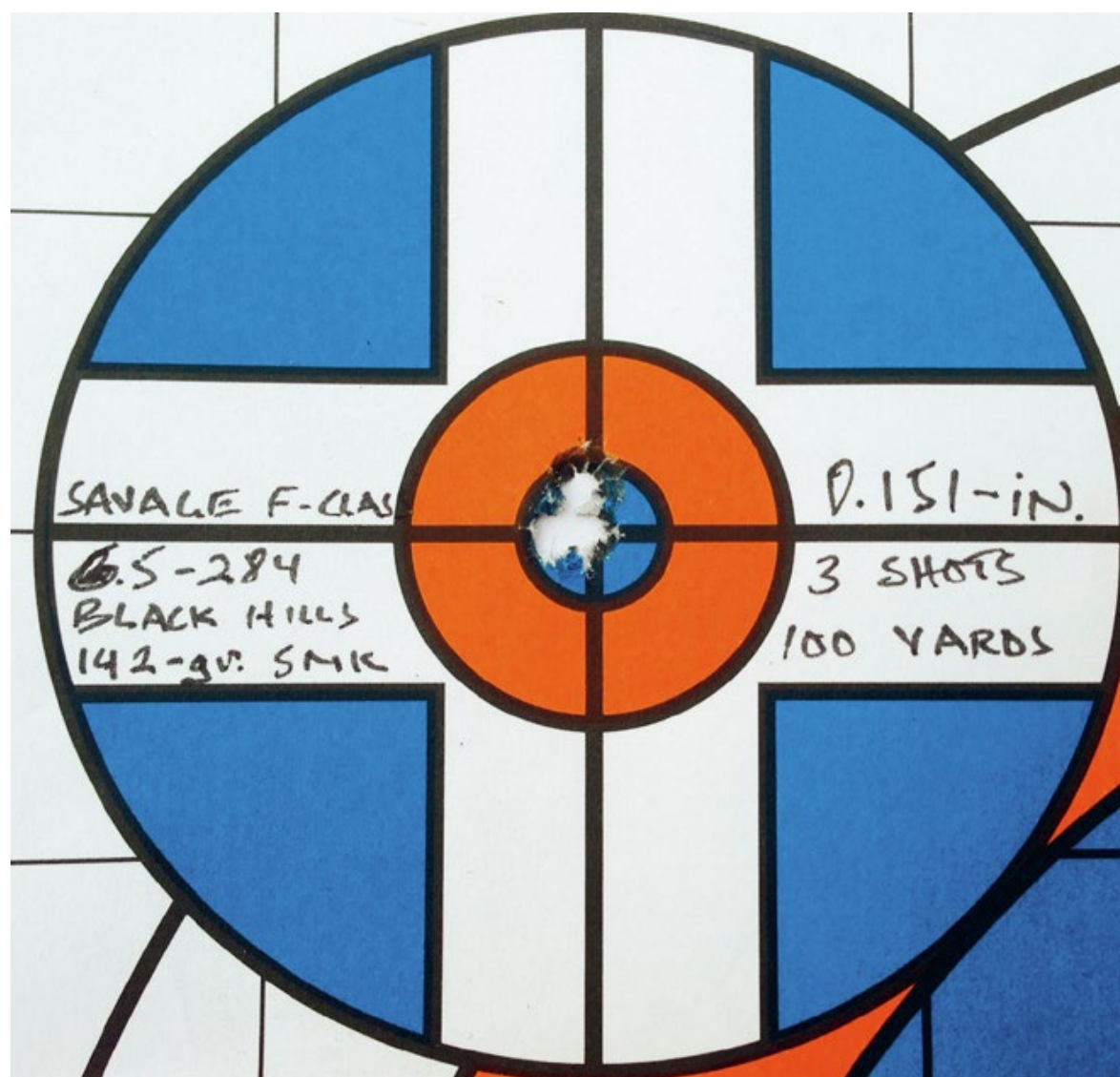
The targets will go to the half-mast position and the range officer will call out the end of the prep period. After the classic command, "Ready on the left, ready on the right, all ready on the firing line," he'll then indicate that when your targets appear you may fire.

After each shot, the relay in the target pits will pull down your target, pull the spotter disc from the previous hole and put it in the new bullet hole and cover the old hole with a paster. Before running the target back up, they'll score the shot with an orange disc on the edge of the target backing: three o'clock for an

X, bottom right corner for a 10, bottom center for a nine, bottom left for an eight and nine o'clock for a seven. If you fire a six, the scoring disc goes at the three o'clock X position, but the spotter disc will be out in the white portion of the target instead of the black.

Fast, reliable work in the pits is invaluable to the shooter on the line. And since he'll be pulling, spotting and pasting for you during your relay, it's worth doing your best. Get the target back up just as fast as you can, allowing the shooter to get his rounds downrange while conditions hold. Speedy target work will also give the shooter time to wait out a fickle condition if need be.

The third part you'll play in the F-Class universe is that of scorer. During the relay before yours, you'll sit on a folding stool (bring one!) just behind the shooter in your assigned position and watch the target through a spotting scope, marking each shot on his or her score card as the target raises back



While you could get by with a one m.o.a. rifle, something that shoots like the Savage Model 12 F-Class rifle gives you a lot more leeway—and makes the experience a lot more rewarding.



to firing position with the spotting and scoring discs in new positions.

This is a great time to observe the wind. Attend to your duties as a spotter, but as time permits watch the targets up and down the line—often a trend will emerge as the bulk of shooters underestimate or over-compensate for the wind. For example, if the relay on the line is hitting in the left side of the target most of the time, you'll know that there's a stronger right wind than they think. When your turn comes up, make your best wind call according to the flags and mirage and then add a bit.

Many shooters try to pace themselves to minimize the effect of barrel heating, but assuming I've got a good target puller, I like to pick a condition and get all my shots downrange as fast as possible to minimize the possibility of a major shift in wind. As you can imagine, it's important to have a rifle that holds its zero and maintains superb accuracy through 20-plus rounds.

Speaking of round counts, I keep two

boxes at hand: a sighter box and a full 20-round box. After firing my sighters, I switch to the full box so I always know just how many rounds I've fired. When the box is empty I know I'm done. Get in a rhythm: loading, observing your last impact as the target appears with the newly placed spotter disc, adjusting your hold if necessary and squeezing the trigger.

If you manage to average nines, you'll qualify as a Master shooter on the NRA's records. With the right equipment, good foundational skills and a very calm day, that's a quite-possible goal. That said, perfectly calm days are rare on 1,000-yard ranges, and averaging nines on a windy day will often win you the match.

Sometimes even less will do the

trick. On my first match—a windy day in Wendover, Utah, the competition held on a retired World War II airfield where, allegedly, the initial training of the B29 Superfortress crews that dropped atomic bombs on Japan and ended the war in the South Pacific took place—I didn't average nines and ended up winning.

These days, shooters of all ages and in all walks of life compete in F-Class. For mastering the finer points of complex ballistics, compensating for wind and getting the most out of superb precision equipment, no discipline provides a superior university. Or better company. Many F-Class competitors are savvy, experienced shooters willing to share insights and help you in any way they can. ■



High BC bullets are the key to beating the wind. Two examples include Sierra's 142-grain 6.5mm MatchKing in the Black Hills load the author used and the Berger 140-grain VLD.



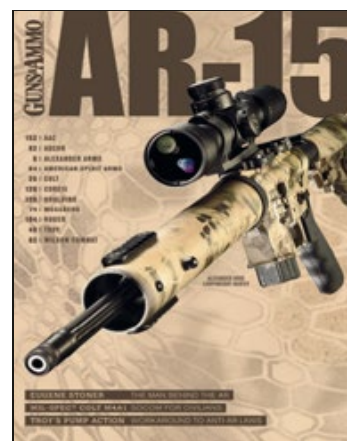
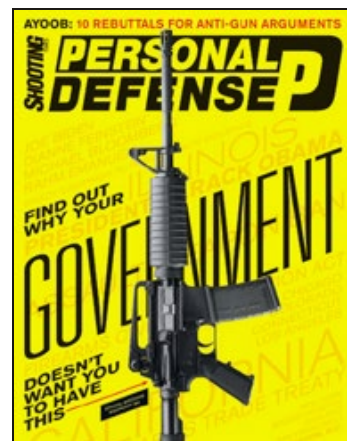
In F-Class you'll also pull pit duty—hauling down fellow shooters' targets and indicating shot location and value. It's actually fun and a great way to meet other competitors.



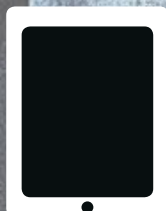


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## RIFLE REPORT

by  
James Tarr



# Barrett REC7 Gen II

**O**ne thing piston ARs are known for when compared to direct gas-impingement guns is extra weight because of the additional parts. Barrett's original REC7 tipped the scales at 7.6 pounds, but most of the extra weight wasn't due to the piston parts but rather the nine-inch Daniel Defense Omega-X free-float quad rail handguard.

The new version of the REC7, the Gen II, sports a much slimmer Barrett Enhanced Rail handguard with a Key-Mod attachment system. This change dropped the weight of the REC7 from 7.6 to 7.2 pounds. It handles nicely and balances at the forward receiver pin with the stock extended.

The REC7 Gen II has a mid-length gas system. It has a medium-weight 16-inch barrel with a 5.56 NATO chamber and a 1:7 twist, and the bore is chrome lined. The barrel has been magnetic

particle inspected. Barrett also offers the REC7 Gen II in 6.8 SPC and an SBR version with a 9.25-inch barrel.

The Barrett's piston is a one-piece design and is manufactured of 17-4 stainless steel. The REC7 Gen II's gas block is chrome lined, and the gas regulator is nitrided for added durability. A 1913 Picatinny-style rail has been machined into the gas block, which is hardened billet steel. It features a continuous top rail and has a two-inch polymer rail section attached at the three o'clock position at the muzzle end.

The rifles are Cerakoted for corrosion resistance and offered in various colors. I received a rifle in OD green to test. They are also offered in gray, flat dark earth and, of course, black. My test rifle wore a Magpul MOE stock, grip and enhanced trigger guard—all in black. Two 30-round Magpul PMags are provided, as is a multi-compartment

### SPECIFICATIONS

#### BARRETT REC7 GEN II

TYPE	piston AR-15
CALIBER	5.56 NATO (tested), 6.8 SPC
CAPACITY	30-round magazines (2 supplied)
BARREL	16 in., 1:7 twist (as tested), w/3-prong flash hider; 9.25 in. SBR
OVERALL LENGTH	32.25–36.625 in.
WEIGHT	7.2 lb.
RECEIVER	7075-T6 billet aluminum
FURNITURE	Magpul MOE stock and pistol grip, Barrett Enhanced Rail fore-end
TRIGGER	Geissele SSA two-stage; 4.5 lb. pull (measured)
SIGHTS	PRI iron sights; optics rail
PRICE	\$2,759
MANUFACTURER	Barrett Firearms, BARRETT.NET

soft tactical rifle case that is easily a \$200 value (Barrett sells them separately for only \$99).

The original REC7 had an A2-style pistol grip and an A2 flash hider on the end of the barrel. In addition to the Magpul MOE grip, the Gen II features a modern three-prong flash hider of the



type proven to be most effective.

What else has changed? The flip-up sights on the original REC7 were from Midwest Industries, but the Gen II sports nice sights from PRI that are very tough. The new gun also comes with my favorite aftermarket enhanced charging handle: the BCM Gunfighter Mod 4 (medium).

Perhaps most importantly, Barrett got rid of the heavy, gritty, GI-type trigger of the original model and installed a Geissele SSA in the REC7 Gen II. The Geissele SSA is a two-stage trigger that provides a crisp 4.5-pound pull without any more parts than the original GI model. It is the standard for durability and quality when you're talking about lighter-than-GI triggers suitable for hard use. The SSA alone retails for \$240.

Piston ARs have become popular over the last few years, and the main advantage being talked about by most people is how they're "more reliable" than direct gas-impingement AR designs. But the fact of the matter is that the main advantage of the piston AR design has nothing to do with reliability but rather heat.

The 5.56 cartridge generates the same amount of heat no matter the rifle it is fired in, but where that heat goes is the variable. With a direct gas-impingement gun, much of it is directed back into the receiver and the bolt carrier group. With a piston gun, gas does not get vented back into the receiver but instead into the face of the piston, keeping more heat away from the user and the carrier group. Cooler parts not only run longer but also last longer.

Taking the Barrett out to the range brought no surprises. It was soft-shooting and ran reliably with everything I fed it, including Wolf steel-case ammu-



The Gen II features a modern three-prong flash hider, and the PRI front sight is built bank-vault tough.

munition. Accuracy was more than acceptable, with several brands running close to one m.o.a.

The cost of the Geissele trigger (\$240) is roughly how much more the REC7 Gen II costs compared to the previous model, but I think Barrett is offering much more value for the money with the Gen II. After testing the original REC7, I came to the conclusion that while being very expensive it was nearly a rack-

grade rifle with only a very few extras moving it away from pure mil-spec. The Gen II has many substantial upgrades. But because it's twice the cost of many direct-impingement rifles that are just as accurate, I think Barrett is charging a lot for the Gen II simply because of the name on the receiver. That said, I like the looks of the Gen II better, and the rifle itself is a much better value now that it has been upgraded. ■



The Gen II is almost a half-pound lighter than its predecessor, and the weight loss is due entirely to a new, slimmer fore-end that features KeyMod slots.



Barrett is Cerakoting its receivers in several colors, and the bolt carrier group is chrome plated for reliability and easier cleaning.

ACCURACY RESULTS				
BARRETT REC7 GEN II				
.223 Rem.	Bullet Weight (gr.)	Muzzle Velocity (fps)	Standard Deviation	Avg. Group (in.)
BLACK HILLS TSX	50	3,226	19	1.09
WOLF GOLD FMJ	55	3,052	55	1.67
WOLF STEEL CASE SP	55	2,861	65	2.23
FEDERAL BTHP	69	2,541	22	1.18
BLACK HILLS HP	77	2,583	29	1.42

**Notes:** Accuracy results are the averages of four five-shot groups at 100 yards from a sandbag rest. Velocities are averages of 10 shots measured with an Oehler Model 35P 12 feet from the muzzle. Abbreviations: BTHP, boattail hollowpoint; FMJ, full metal jacket; HP, hollowpoint; SP, softpoint



**RIFLE  
REPORT**  
by  
Joseph von Benedikt



# Ruger Gunsite Scout 5.56

**I**'ve never really been a disciple of Colonel Cooper's scout rifle concept: a short, handy bolt action with a forward-mounted optic, chambered in an authoritative cartridge, fed from a detachable magazine. For a fighting gun I like short and quick but prefer the wide field of view of an optic mounted close to my eye. Plus, while I understand that the forward-mounted scout scope offers better access to the top of the receiver, who really uses stripper clips with a bolt action these days?

But Ruger's latest version of this carbine, chambered in 5.56 NATO, may make me a convert. The design engineers at Ruger and their partners at Gunsite thought out every element to perfection.

For starters, the sights are really nice. The front is a stout winged post on a base that sleeves the barrel—it's

all one piece—and the blade is just slender enough for fine shooting. The rear is a sturdy aperture, adjustable for windage and elevation and also winged for protection.

Crushing my argument against the limitations of a forward-mounted scope is that the rear sight is easily removed, and Ruger's well-known scope ring base cuts are machined into the action—enabling users to mount a scope either forward or rearward, whatever they prefer.

The forward optic base is a solid 6.1-inch section of 1913 Picatinny rail secured to the barrel by two burly screws front and back. It's ideally located for use with an extended eye relief scope or a non-magnified reflex-type optic.

Interestingly, the bottom "metal" is glass-reinforced nylon. It houses a steel 10-round magazine made by Accurate-Mag. From what I can tell, the new 5.56 version uses the same

## SPECIFICATIONS

### RUGER GUNSITE SCOUT

TYPE	bolt-action centerfire
CALIBER	5.56 NATO
CAPACITY	10-round magazine
BARREL	16.1 in., 1:8 twist, threaded, w/flash suppressor
OVERALL LENGTH	37–38.5 in.
WEIGHT	7 lb., 2 oz.
STOCK	gray laminate
FINISH	matte black
TRIGGER	single-stage, 4 lb., 10 oz. (measured)
SAFETY	three-position wing type
SIGHTS	blade front, adjustable rear aperture; scout-type 1913 optic rail
PRICE	\$1,039; stainless \$1,099
MANUFACTURER	Ruger, RUGER.COM

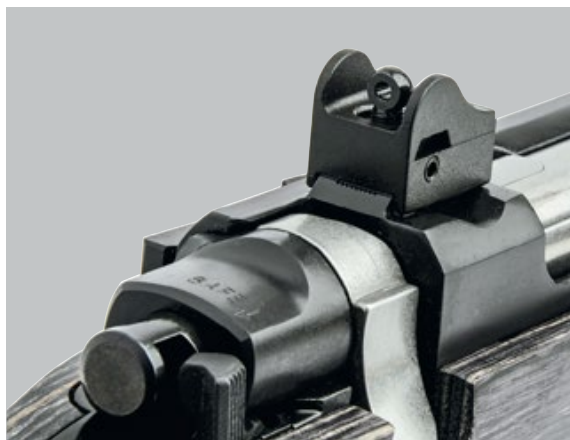
magazine as the .308 version but is fit with an internal polymer that sleeves it down to .223 size. Scuttlebutt on the Internet is that Ruger should have found a way to use AR-15 magazines, and I must admit I agree. They would be cheaper, lighter and much smaller than the adapted magazine

But it's not nearly that simple, as Ruger's Mark Gurney points out. "The en-



tire action would have to be completely replaced with an all-new design. The Mauser-style controlled-round feed and big claw extractor would almost certainly be gone,” he told *RifleShooter*.

As it is, the steel Accurate-Mag is surely more durable and precisely made than an AR-15 mag. It’s released via a Mini-14 type catch just forward of the trigger guard.



The Gunsite Scout’s rear sight is a sturdy, wing-protected unit, paired with an equally tough wing-protected blade front. The rear can be removed for traditional scope mounting.

The trigger is nice and crisp but a bit heavy. The one on my test rifle measured four pounds, 10 ounces on a Lyman trigger gauge. On a carbine meant for defense, a trigger on the heavy side is considered appropriate by many, although I like my triggers lighter. The safety is a three-position wing type, and it locks the bolt in place in the rear-most position. When engaged, it



While many would have liked the rifle to accept AR-15 mags, that’s not possible with the Hawkeye’s controlled-round-feed action. The gun takes steel Accurate-Mags.

also blocks the firing pin from falling, which I prefer to safeties that block only the trigger.

A Mauser-type latch allows the bolt to be withdrawn to the rear for cleaning. The bolt is a one-piece design sporting a strong, 0.4-inch-wide, non-rotating claw extractor. It’s a proper controlled-round mechanism, appropriate on a carbine where reliability is paramount.

The 16.1-inch barrel has a 1:8 twist, which offers stability and forgiving accuracy over a broad range of projectile weights. As you’ll see on the accompanying chart, the carbine performed well with bullets weighing from 40 to 75 grains.

Ruger’s flash suppressor is a simple, effective muzzle device. Two flat surfaces allow easy removal for replacement or a suppressor, and the stainless version of the carbine comes with a muzzle thread protector.

The gray laminate stock is tough and impervious to the elements. And because gun fit is critical to the scout rifle concept, the included spacers allow you to change the length of pull. Sling swivel studs come included fore and aft, and very nice checkering at the wrist and fore-end provides grip.

After mounting a light, compact 1.5-4.5x20 Nikon Monarch, I took it to the range with six different loads. My test protocol was to fire three three-shot groups in rapid succession, which tested the carbine’s ability to hold point of impact and maintain tight groups as the barrel heated.

The carbine put half the loads in sub-m.o.a. groups, and two of the other three into sub-1.5 m.o.a. groups. The second and third groups—fired briskly as the barrel heated—showed no discernible point of impact change or loosening of group size.

I also ran some informal drills with the gun and found it balances nicely and points well. Reliability was stellar. The controlled-feed action fed smoothly, extracted cleanly and generally showed its thoroughbred ancestry. The late Colonel Cooper may have just earned another disciple to his scout rifle concept.



One of the key features of the scout concept is a forward-mounted optic, and the Gunsite Scout accommodates that with a six-inch rail section.

## ACCURACY RESULTS

### RUGER GUNSITE SCOUT

.223 Rem.	Bullet Weight (gr.)	Muzzle Velocity (fps)	Standard Deviation	Avg. Group (in.)
HORNADY V-MAX	40	3,331	29	0.76
BLACK HILLS MATCH	52	2,999	28	1.23
FEDERAL PARTITION	60	2,876	38	2.61
REMINGTON SMK	69	2,753	24	0.61
WINCHESTER MATCH	69	2,557	48	0.74
HORNADY BTHP	75	2,556	28	1.36

**Notes:** Accuracy figures are the averages of three three-shot groups fired from a bench at 100 yards, without allowing the barrel to cool. Velocities are averages of nine rounds measured with a Shooting Chrony chronograph at 10 feet.



# Championing Cartridges

**G**un writers of previous eras had it a bit easier. There were far fewer choices, and they could latch onto a good cartridge or caliber and make lots of hay by promoting it. For Col. Townsend Whelen it was the .30-06. Even though the .35 Whelen bears his name, he was an '06 guy. Other outspoken fans of the '06 included Theodore Roosevelt and Ernest Hemingway (in both talent and audience they were a bit more than gun writers).

A young Jack O'Connor latched onto the brand-new .270 Win. in 1925. O'Connor actually used many cartridges through his long career, but the .270 remained his favorite. He was very good for the cartridge, but the cartridge was also very good to him, and together they made a lot of music.

Elmer Keith championed the .33s with heavy-for-caliber bullets. I think he really believed in this formula, but his writing was often colored by the genuine hatred he felt for O'Connor. He started with the British .333-inch bullet diameter, using it for several wildcats. Although he didn't actually design it, his work led up to the .338 Win. Mag.

Warren Page, long-time shooting editor at *Field & Stream*, did much less sheep hunting than O'Connor, but he did a lot more African hunting. Page latched onto the fast 7mm. His own fast 7mm wildcat cartridges would fill a large book, and his work with that bullet diameter undoubtedly led up to the 7mm Rem. Mag.

My old friend Col. Charles Askins was busy with a long military career while many of these lines were being drawn, so there wasn't a popular and versatile caliber left for him to claim.

Perhaps from default, or perhaps because he was a cantankerous cuss, he settled on the 8mm (caliber .323 inch). Keith didn't design the .338 Win. Mag., Page did not design the 7mm Rem. Mag., and Askins did not design the 8mm Rem. Mag., but they each developed an extensive array of wildcats on their favorite bullet diameters, and it's appropriate to give them credit.

In the caliber popularity contest, Keith, Page and O'Connor won and Askins lost. The 8mm has never been popular in North America and probably never will be. I suspect Askins knew that all along; he was just being reactionary—which he could be, and irascible and sometimes abrupt—but he was a friend to me, in a time when new editors and writers had a hard time making friends.

One time I was at his home in San Antonio and he showed me his newest project: the .29 Askins. He was having bullets swaged down to .29 caliber because that bullet diameter didn't exist. I loved Charlie, but this was going too far. We have plenty enough bullet diameters and case dimensions and, realistically, lots of overlap with cartridge performance. Thank God he didn't sell anybody on the .29 caliber.

In the United States, when we think of "popular and standard" big game calibers for North American game most of us think 6mm (.243), .25 (.257), .270 (.277), 7mm (.284), .30 (.308) and perhaps .338. These are all excellent calibers for big game hunting. But let's understand the difference between caliber and cartridge. The former is the bullet diameter, whether metric or English; the latter is the caliber plus case

dimension. And there are usually several cartridges that use the same-caliber bullet with different case dimensions (which means different velocities).

Conspicuously missing from my list of popular American calibers, meaning bullet diameter, are both Askins's 8mm and the 6.5mm (.264 inch). Although Europeans like the 8mm, Askins is the only American to champion this bullet diameter. The 8mm Rem. Mag. hangs on, barely, and there has been some interest in the efficient and powerful .325 WSM, but you can't call the 8mm a popular diameter.

The 6.5mm has been even more lacking of a champion, with no one taking up that sword for nearly a hundred years. In the dawn of smokeless powder there were a bunch of 6.5mm military

cartridges producing velocities unheard of with blackpowder—and, with jacketed bullets, unprecedented penetration. Although often considered such, W.D.M. "Karamojo" Bell was not a 6.5mm fan. He used it, as did many early ivory hunters, but he reckoned the bullets were too long and thin for the caliber and had the tendency to bend.

Not so, said Chauncey Hugh Stigand, British officer by trade, hunter by furlough. At the beginning of the 20th century, Stigand, author of *Hunting the Elephant in Africa* (Macmillan, 1913), was perhaps the most outspoken of the small-bore advocates. However, when he died fighting a valiant rear-guard defense against Dinka warriors in Sudan in 1919, the numerous cartridge cases around his body were not 6.5mm; they were good old .303 British.

**[Askins] was having bullets swaged down to .29 caliber because that bullet diameter didn't exist.**

*Continued on page 20*



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